ICD-R100

SERVICE MANUAL

Ver 1.0 1999.03

Tourist Model

SPECIFICATIONS

Recording media
Built-in flash memory, Monaural recording
Recording time
SP: 64 minutes
LP: 150 minutes
Frequency response
SP: 280 Hz - 4,800 Hz
LP: 240 Hz - 2,800 Hz
Speaker approx. 2.8 cm dia.
Power output
110 mW
Input/Output
- Earphone jack (mini jack) for 8 - 300 ohms earphone/headphones
- Microphone jack (mini jack, monaural)
  Plug in power
  Minimum input level
  0.5 mV
  3 kilohms or lower impedance microphone
- Digital I/O connector (15-pin)

Playback speed control
LP mode: FAST +30%
SLOW –15%
SP mode: FAST +20%
SLOW –15%

Power requirements
Two size AAA (LR03) alkaline batteries: 3 V DC
Dimensions (w/h/d)
(not incl. projecting parts and controls
44.4 × 100.5 × 12.5 mm
Mass (incl. batteries)
68 g
Supplied accessories
Size AAA (LR03) alkaline battery × 2
Carrying case × 1

Design and specifications are subject to change without notice.

IC RECORDER

MICROFILM

SONY®

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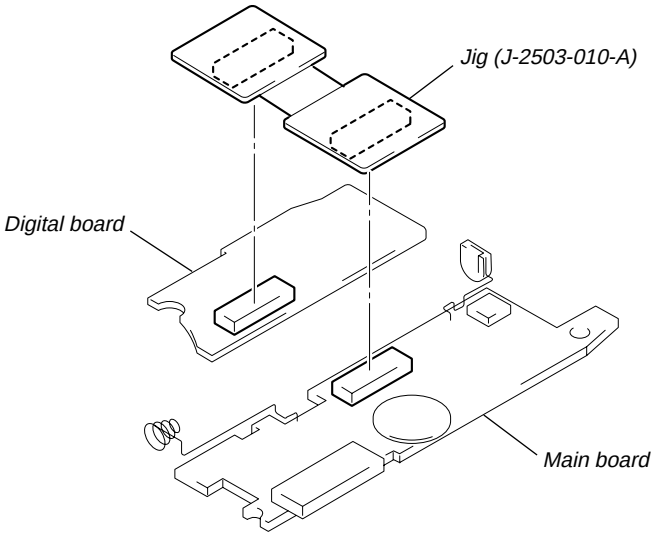
Flexible Circuit Board Repairing
- Keep the temperature of the soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

Notes on chip component replacement
- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

SECTION 1
SERVICING NOTE

Using the special connector jig (J-2503-101-A) to connect the main board and digital board will prove convenient when servicing the unit with power applied.



Note : Do not apply excessive amounts of flux during replacement of electronic components since this may cause electrical shorts due to moisture.
Wipe off flux after electronic components exchange.

CAUTION ON REPLACING FLASH MEMORY

The BAD-BLOCK check* must be executed, when the flash memory (IC701) in this set was replaced.
The set will not operation normally, unless this check is finished.

* The BAD-BLOCK check detects an area (bad-block) in the flash memory where data validity cannot be guaranteed, and saves this information in the TOC-AREA so that a bad-block is not used.

BAD-BLOCK check procedure :

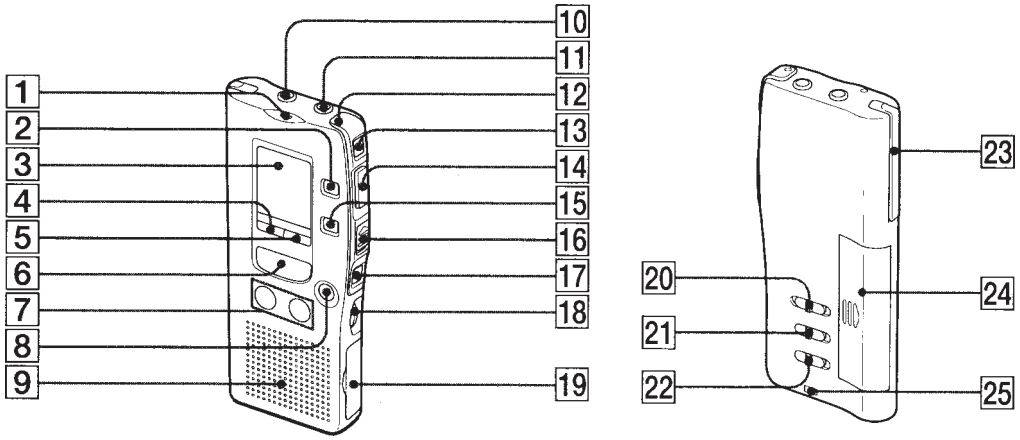
1. Apply 3V from regulated power supply to the battery terminals.
2. Once the power is supplied, the check starts and then proceeds for approx. 3 minutes. (Be sure to keep applying the power during the check)
3. When the check completes, the result is shown as bellows.
   OK : Only the LCD back light LED (D503, 504) turns on.
   NG : Red LED blinks or turns on or green LED turns on in the OPR LED (D502),
4. In case of OK, press the STOP button.

Note :
- In case of NG, check system control IC (IC704), flash memory IC (IC701) and the peripheral circuit. (Particularly, check carefully the soldering of the flash memory)
- After finishing the BAD-BLOCK check, assemble the set, load the dry battery, and confirm if the set operates normally.

SECTION 2
GENERAL

This section is extracted from instruction manual.

LOCATION AND FUNCTION OF CONTROLS



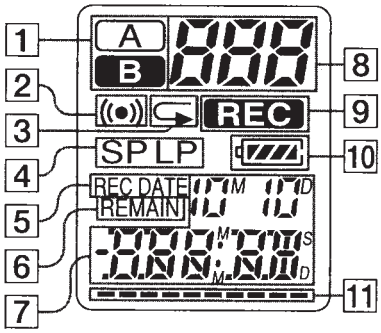
Main unit

1 MIC (built-in microphone)
2 INDEX button
3 Display window
4 DISPLAY button
5 MENU button
6 ►PLAY/STOP•EXECUTE (play/stop•enter) button
7 I◄◄ REVIEW/►►I CUE (fast backward, review/fast forward, cue•selection of menu mode) button
8 ■ STOP button
9 Speaker
10 MIC (PLUG IN POWER) jack
11 EAR (earphone) jack
12 OPR (operation) indicator
13 ❚❚ PAUSE button
14 ● REC (record) /STOP button
15 FILE button
16 HOLD switch
17 ERASE button
18 VOL (volume) control
19 DIGITAL I/O connector for PC connecting kit (available in Japan only and in Japanese only)
20 PLAY SPEED selector
21 MIC SENS (microphone sensitivity) selector
22 VOR selector
23 Clip*
24 Battery compartment
25 Hook for handstrap (not supplied)

* To use the clip, see the illustration on page 47 in the Japanese instruction manual.

Notes

- To prevent the clip from breaking, avoid hooking it on thick fabric, such as a pocket of a heavy coat.
- When bending down or running with the unit clipped on your pocket, be careful not to drop the unit.



Display window

1 File indication
2 Alarm indicator
3 Repeat play indicator
4 Recording mode indication
5 REC DATE (recording date) indication
6 REMAIN indicator
7 Counter , Remaining time indication, Recording date indication, Current time indication (see page 18), Menu indication, Messages
8 Selected file number
Total number of messages in a file
Mode indication of the menu (ON, OFF, etc.)
9 REC (recording) indicator
10 Remaining battery indicator
11 Remaining memory indicator

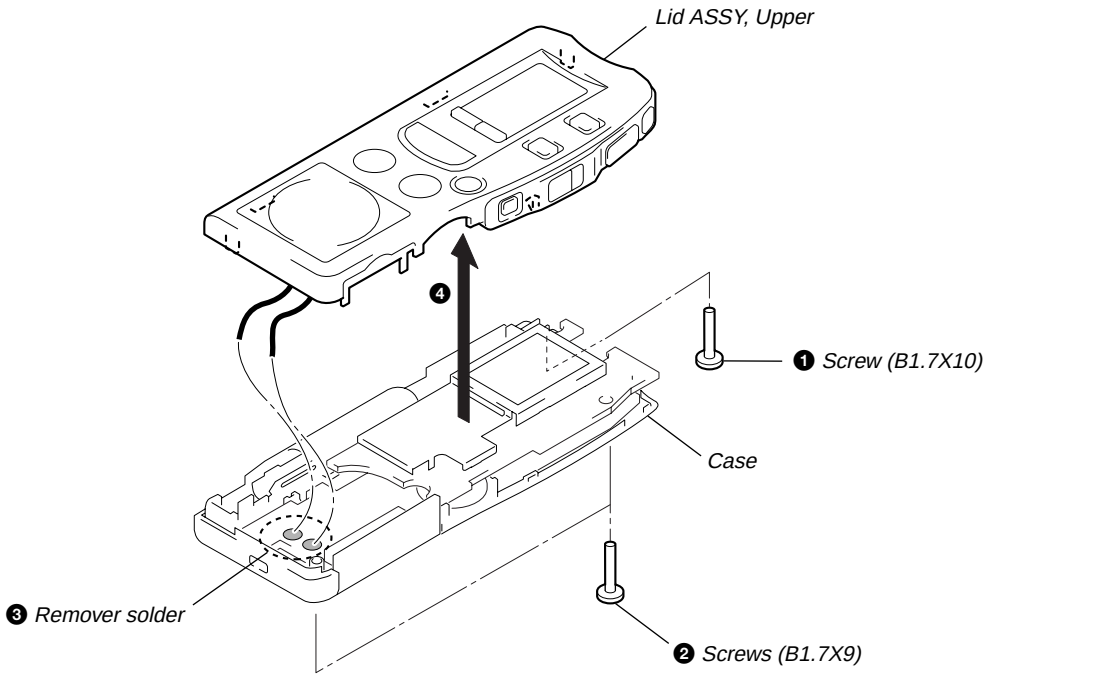
SECTION 3
DISASSEMBLY

● The equipment can be removed using the following procedure.

Set → Lid ASSY, Upper → Digital board → Jack board → Main board
Digital board → Switch unit

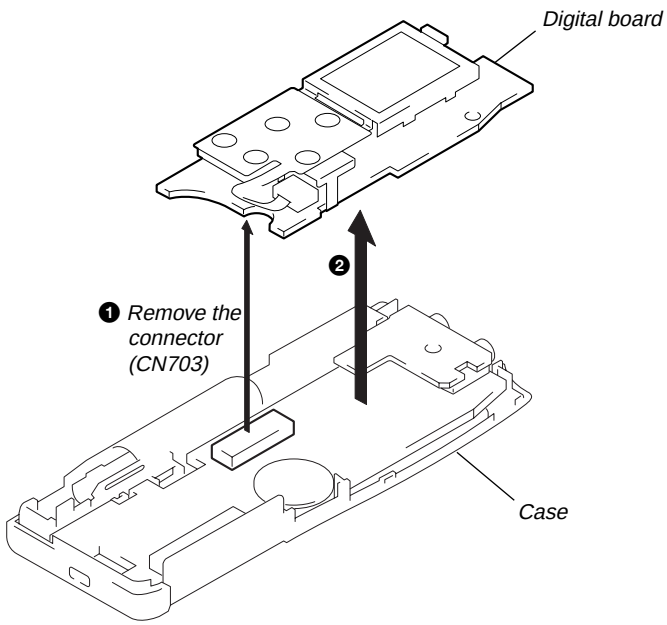
Note : Follow the disassembly procedure in the numerical order given.

3-1. LID ASSY, UPPER

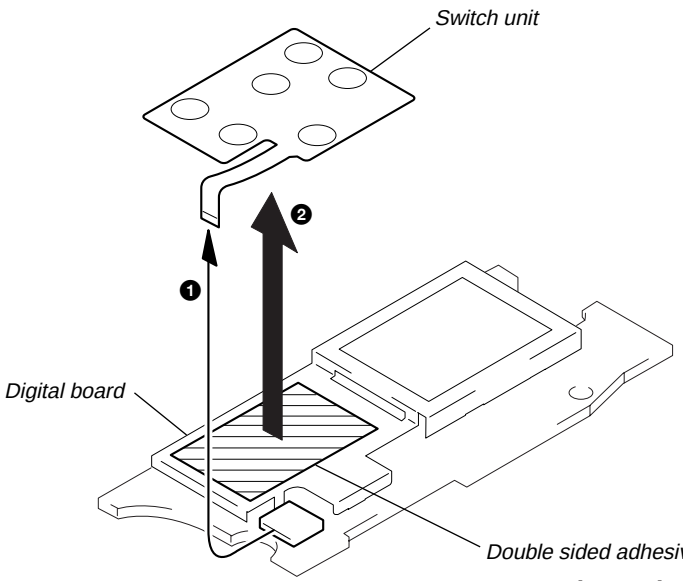


Note : Not using a screw (10mm) of step ❶ for this place.

3-2. DIGITAL BOARD

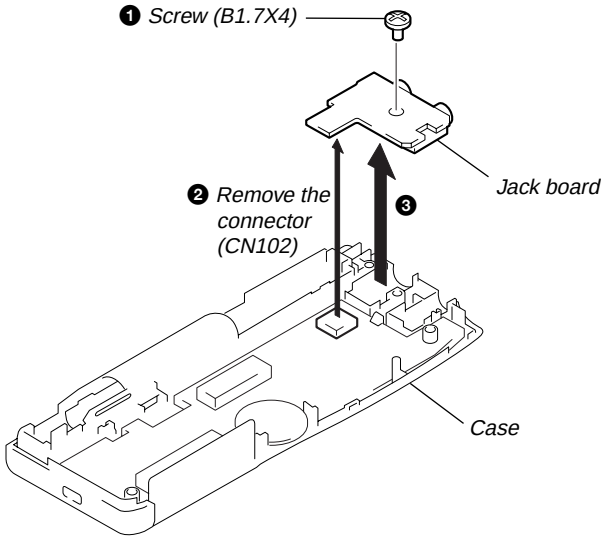


3-3. SWITCH UNIT

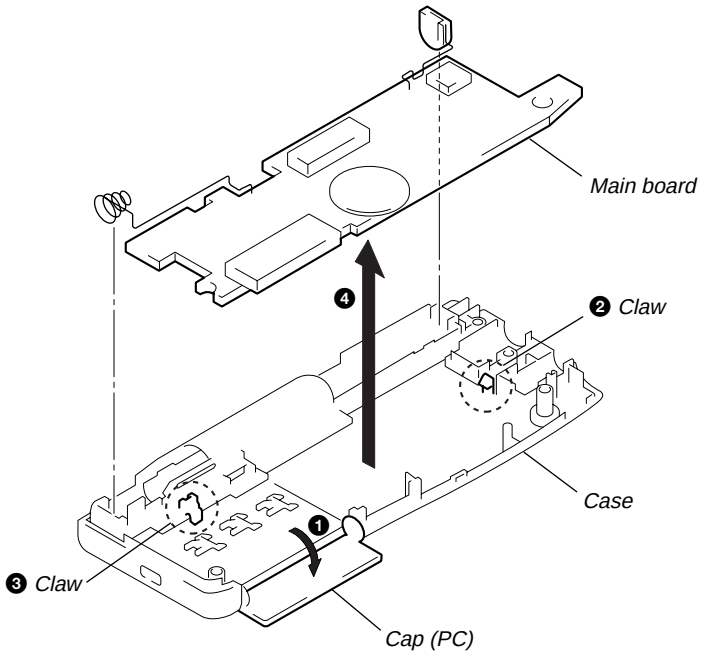


Note : The switch unit is secured with double-sided tape.
When removed the switch unit, change it for a new component.

3-4. JACK BOARD



3-5. MAIN BOARD



SECTION 4
DIAGRAMS

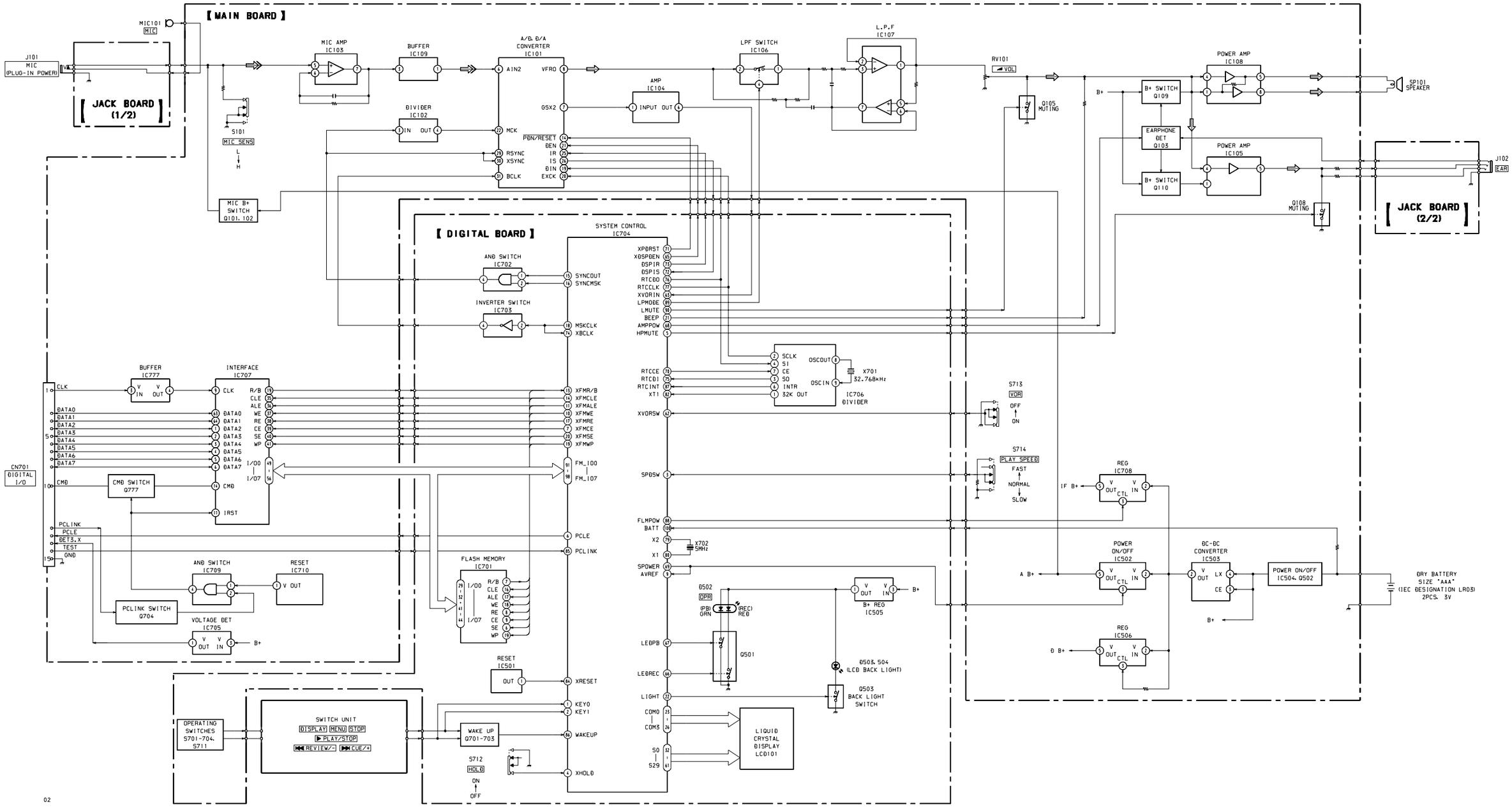
4-1. EXPLANATION OF IC TERMINALS

IC704 μPD780308GC-113-8EU (SYSTEM CONTROL)

Pin No.	Pin name	I/O	Description
1	KEY0	I	Key input
2	KEY1	I	Key input
3	SPDSW	I	Playback speed switch input.
4	XHOLD	I	Hold switch input.
5	HPMUTE	O	Earphone mute output.
6	PCLE	O	PC link permission signal output.
7	XFMCE	O	CE output for flash memory.
8	VDDO	–	Power supply terminal.
9	AVREF	I	A/D reference voltage input.
10	XFMWE	O	Write enable signal output for flash memory.
11	XFMALE	O	ALE signal output.
12	VSS1	–	Ground.
13	XFMR/B	I	Flash memory Ready/Busy signal input.
14	XFMCLE	O	CLE signal output for flash memory.
15	SYNCOUT	O	SYNC signal output.
16	SYNCMSK	O	SYNC output control signal output.
17	XFMRE	O	Flash memory read enable signal output.
18	MSKCLK	I	SYNC output control clock input.
19	XFMWP	O	Flash memory WP signal output.
20	XFMSE	O	Flash memory SE signal output.
21	BEEP	O	BEEP signal output (2.4kHz).
22	LIGHT	O	LCD back lignt control output.
23 – 26	COMO 0–3	O	LCD common signal output.
27	BIAS	–	Connect to VCC (LCD BIAS).
28 – 30	VLC 0 – 2	–	LCD drive power supply.
31	VSS0	–	Ground.
32 – 61	S0 – S29	O	LCD segment signal output.
62	XVORSW	I	VOR switch input.
63	XVORIN	I	VOR signal input.
64	XTEST	I	Test terminal.
65	XDSPDEN	O	DSP registor control I/F enable signal output.
66	LEDREC	O	REC LED (red) ON/OFF output.
67	LEDPB	O	PLAY LED (green) ON/OFF output.
68	AMPPOW	O	Power down control output for IC108.
69	SPOWER	O	IC101 and analog power supply control output.
70	RTCCE	O	Real time colck CE signal output.
71	XPDRST	O	Reset signal output for IC101.
72	DSPIS	I	Serial data input from IC101.
73	DSPIR	O	Playback serial data output for IC101.
74	XBLCK	O	DSP bit clock signal output.
75	RTCDI	I	Real time colck data input.
76	RTCDO	O	RTC data and DSP registor contrl data output.
77	RTCCLK	O	RTC I/F data and DSP registor control clock output.
78	IC	–	Ground.
79	X2	O	System clock output (5MHz).
80	X1	I	System clock input (5MHz).

Pin No.	Pin name	I/O	Description
81	VDD1	–	Power supply terminal.
82	XT1	I	Sub clock input.
83	XT2	I	Sub clock turn over input.
84	XRESET	I	Reset signal input.
85	PCLINK	I	PC link connection detect input.
86	WAKEUP	I	WAKE UP signal input.
87	RTCINT	I	Real time clock (2Hz) signal input.
88	FLMPOW	O	Flash memory and IC707 power ON/OFF.
89	LPMODE	O	LPF switch control output.
90	LMUTE	O	Line mute ON/OFF signal output.
91 – 98	FMIO 0 – 7	I/O	Data bus.
99	AVSS	–	A/D converter ground.
100	BATT	I	Power supply voltage detect input.

4-2. BLOCK DIAGRAMS

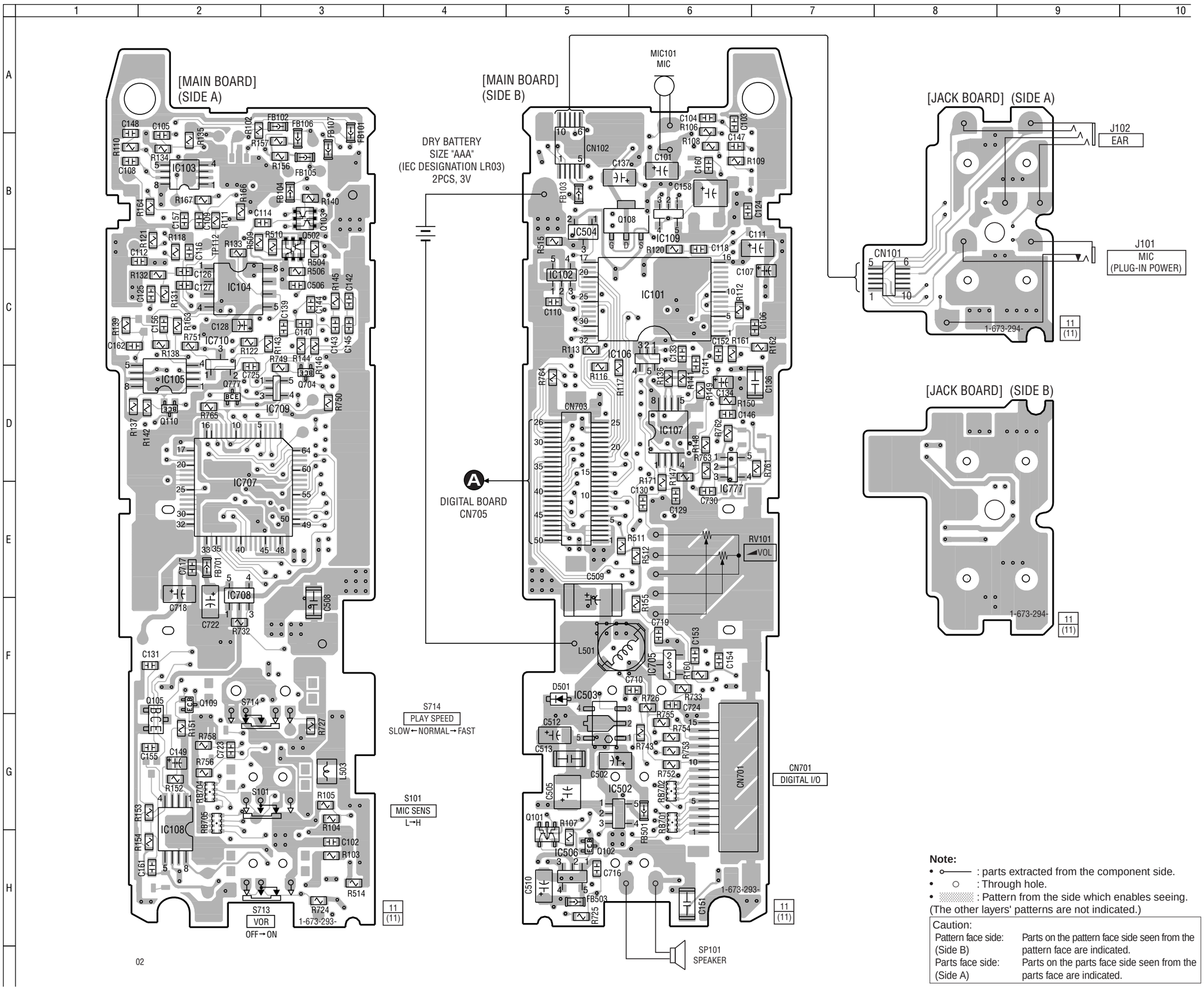


- Signal path.
  ⇨ : PLAY
  ⇨ : REC

- **Semiconductor Location**

Ref. No.	Location
D501	F-5
IC101	C-6
IC102	C-5
IC103	B-2
IC104	C-2
IC105	D-2
IC106	C-6
IC107	D-6
IC108	G-2
IC109	B-6
IC502	G-5
IC503	E-5
IC504	B-5
IC506	H-5
IC705	F-6
IC707	E-2
IC708	E-2
IC709	D-3
IC710	C-2
IC777	D-6
Q101	G-5
Q102	H-5
Q103	B-3
Q105	F-2
Q108	B-5
Q109	F-2
Q110	D-2
Q502	B-3
Q704	D-3
Q777	D-2

4-3. PRINTED WIRING BOARDS (MAIN SECTION)

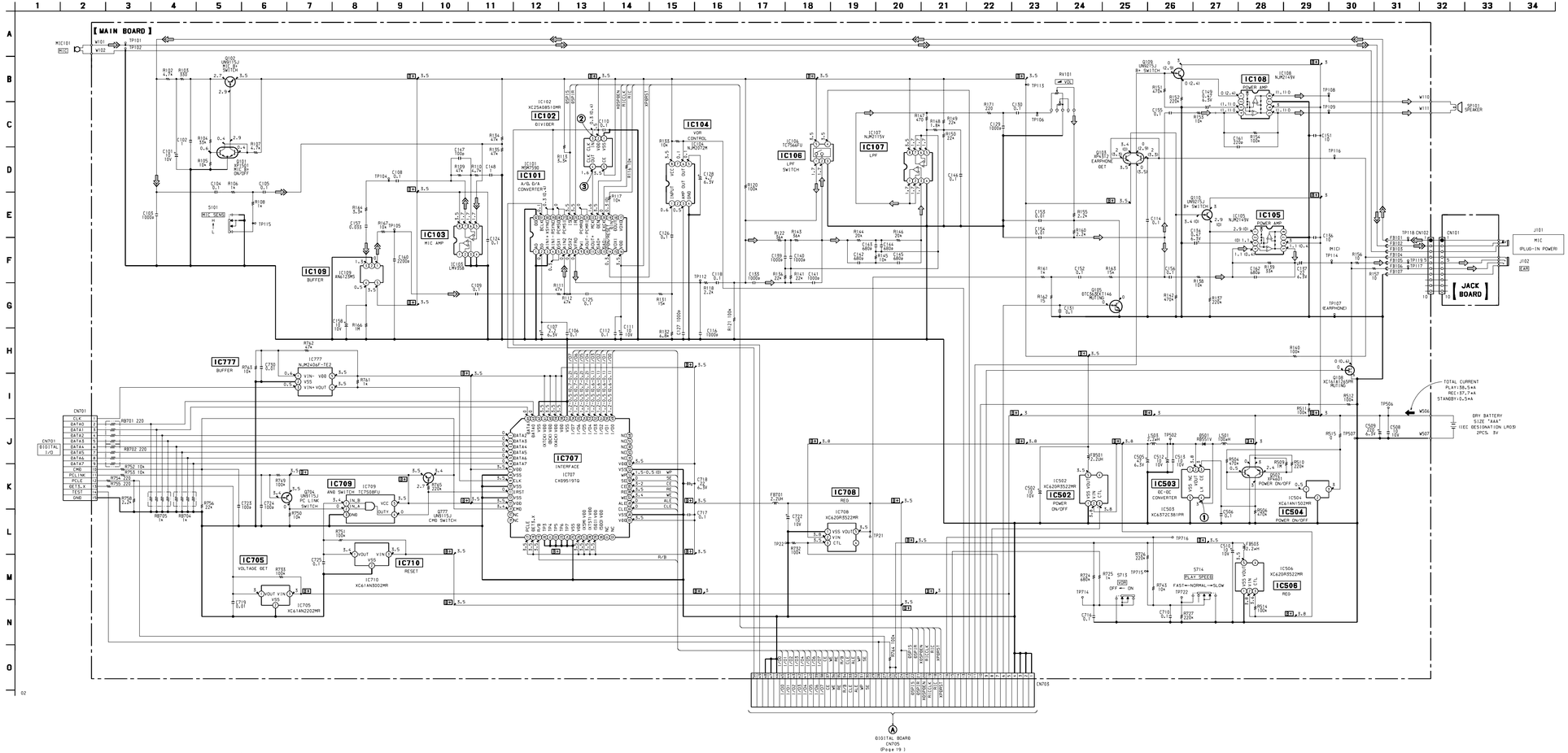


Note:

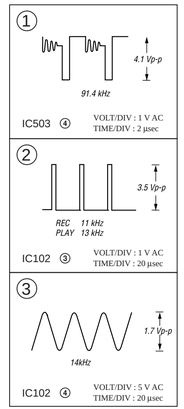
- ⟜ : parts extracted from the component side.
- ○ : Through hole.
- ▒ : Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

Caution:	
Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.



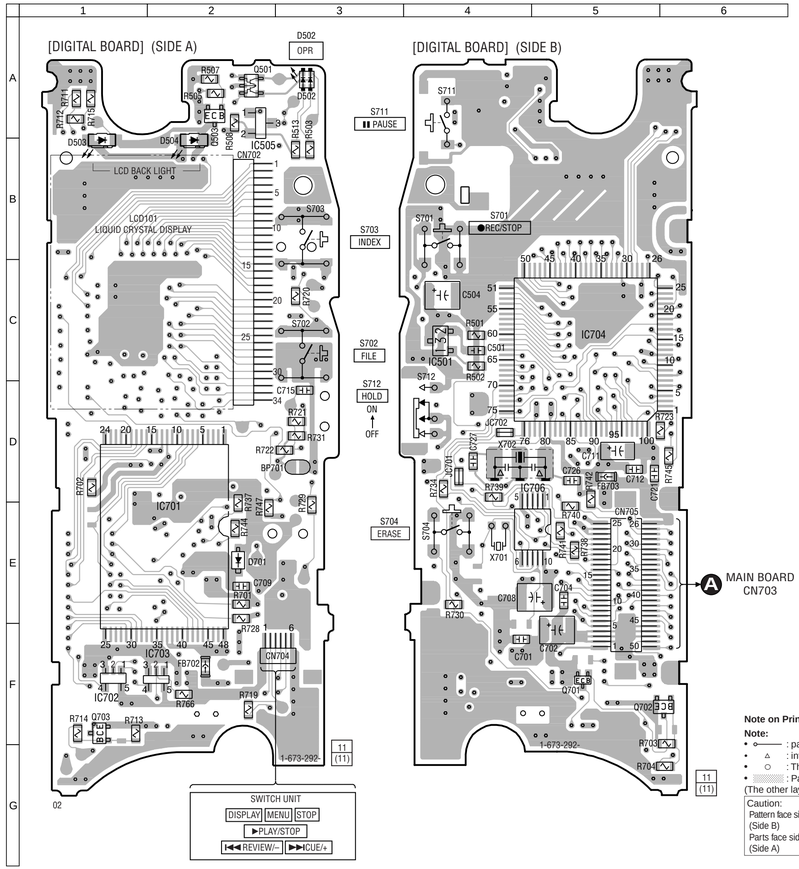
● Waveforms



Note:

- All capacitors are in µF unless otherwise noted. pF: µµF
  50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- B+ Line.
- Power voltage is dc 3V and fed with regulated dc power supply from battery terminal.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark : REC
  ( ) : PLAY
- Voltages and current are taken with a VOM (Input impedance 10 MΩ).
  Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : PLAY
  ⇨ : REC

4-5. PRINTED WIRING BOARDS (DIGITAL SECTION)



● **Semiconductor Location**

Ref. No.	Location
D502	A-3
D503	B-1
D504	B-2
D701	E-2
IC501	C-4
IC505	A-2
IC701	E-2
IC702	F-1
IC703	F-2
IC704	C-5
IC706	E-5
Q501	A-2
Q503	A-2
Q701	F-5
Q702	F-6
Q703	F-1

Note on Printed Wiring Boards:

Note:

- ○——— : parts extracted from the component side.
- △ : internal component.
- ○ : Through hole.
- ▒▒▒ : Pattern from the side which enables seeing.

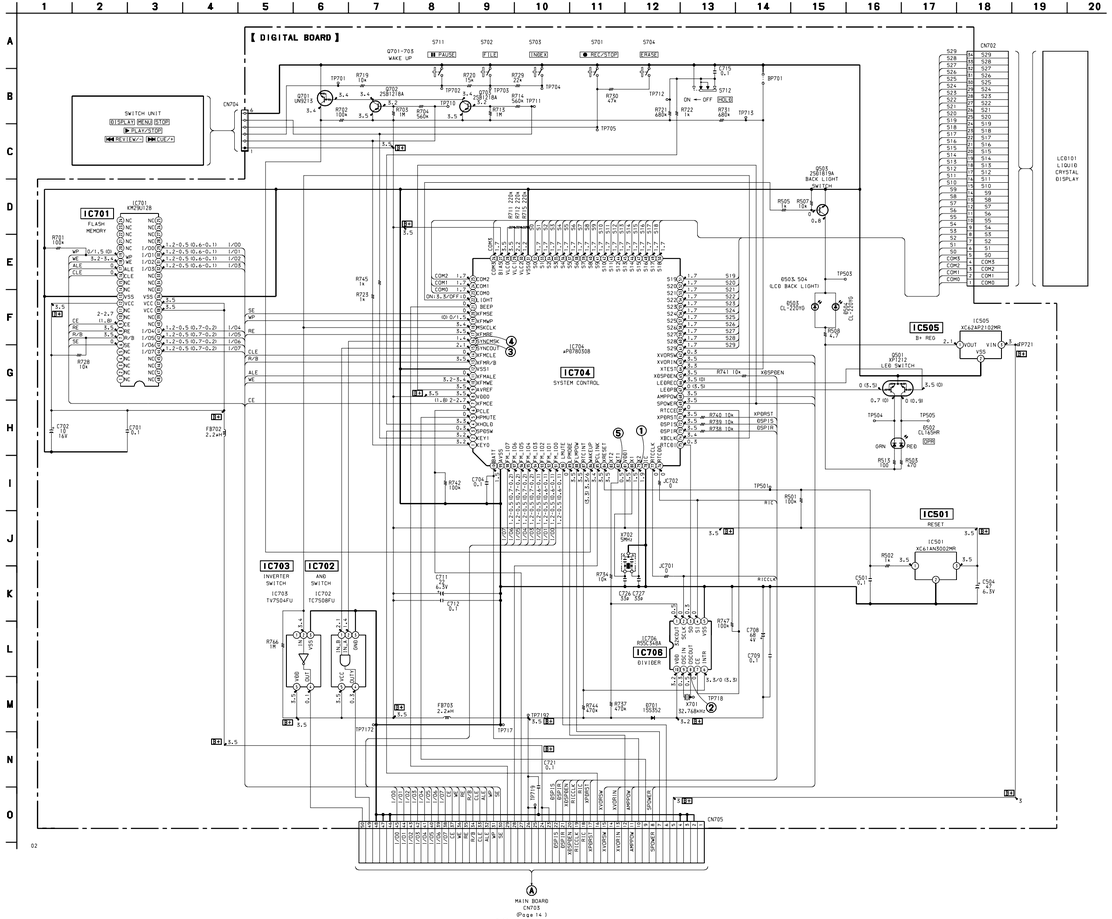
(The other layers' patterns are not indicated.)

Caution:

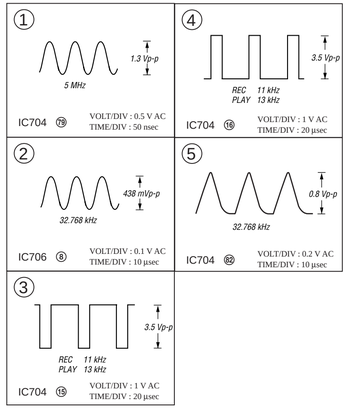
Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.

4-6. SCHEMATIC DIAGRAM (DIGITAL SECTION)

● Refer to page 22 for IC Block Diagrams.



● **Waveforms**

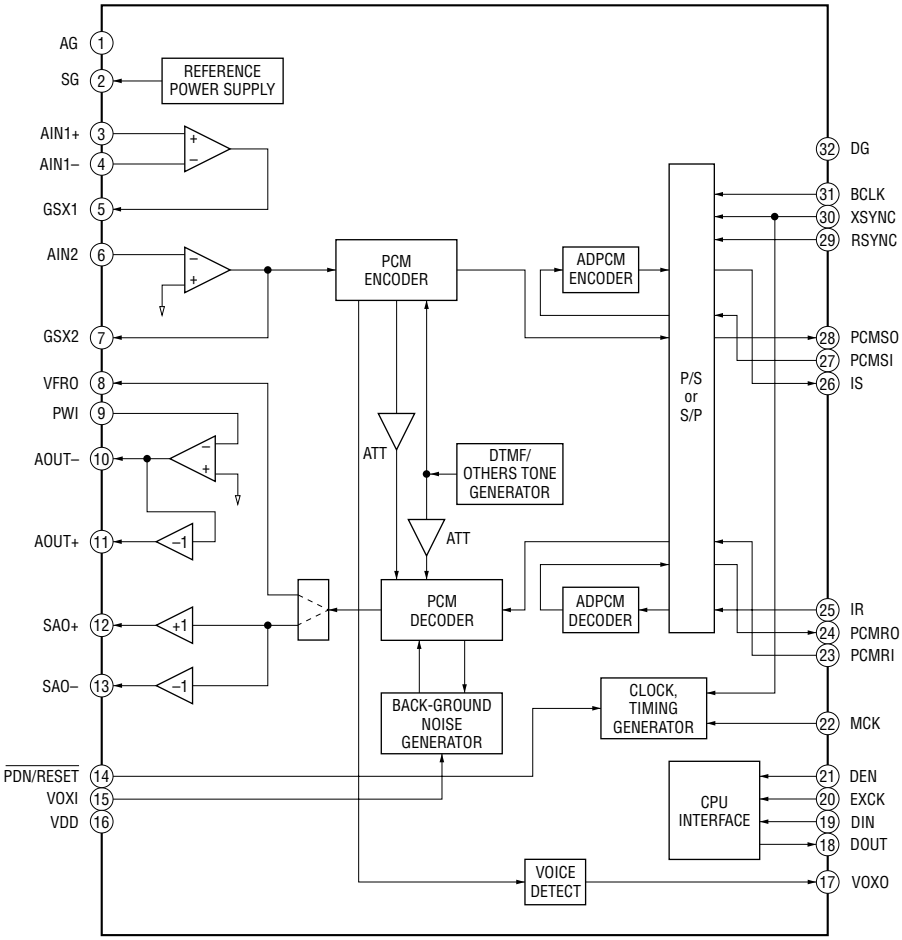


Note:

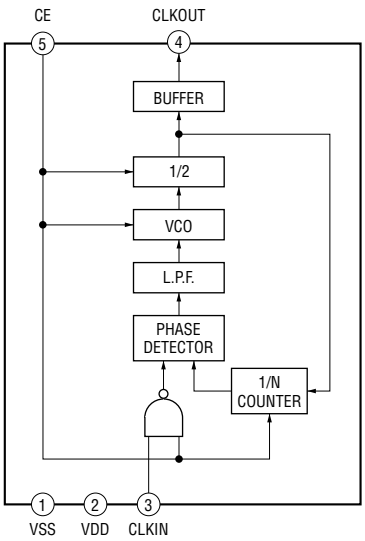
- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- △ : internal component.
- B+ : B+ Line.
- Power voltage is dc 3V and fed with regulated dc power supply from battery terminal.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark : REC
  ( ) : PLAY
- Voltages and current are taken with a VOM (Input impedance 10 MΩ).
  Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.

● **IC Block Diagrams (MAIN SECTION)**

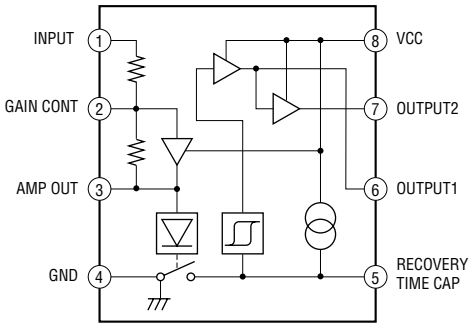
IC101 MSM7590L-01TS-K



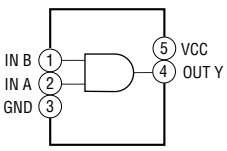
IC102 XC25A08510MR



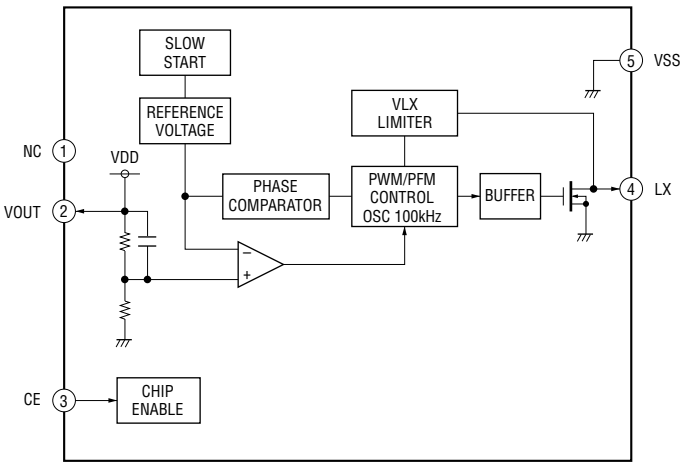
IC104 NJM2072M



IC709 TC7S08FU (TE85R)

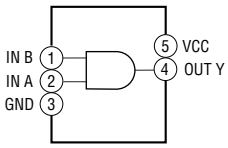


IC503 XC6372C381PR

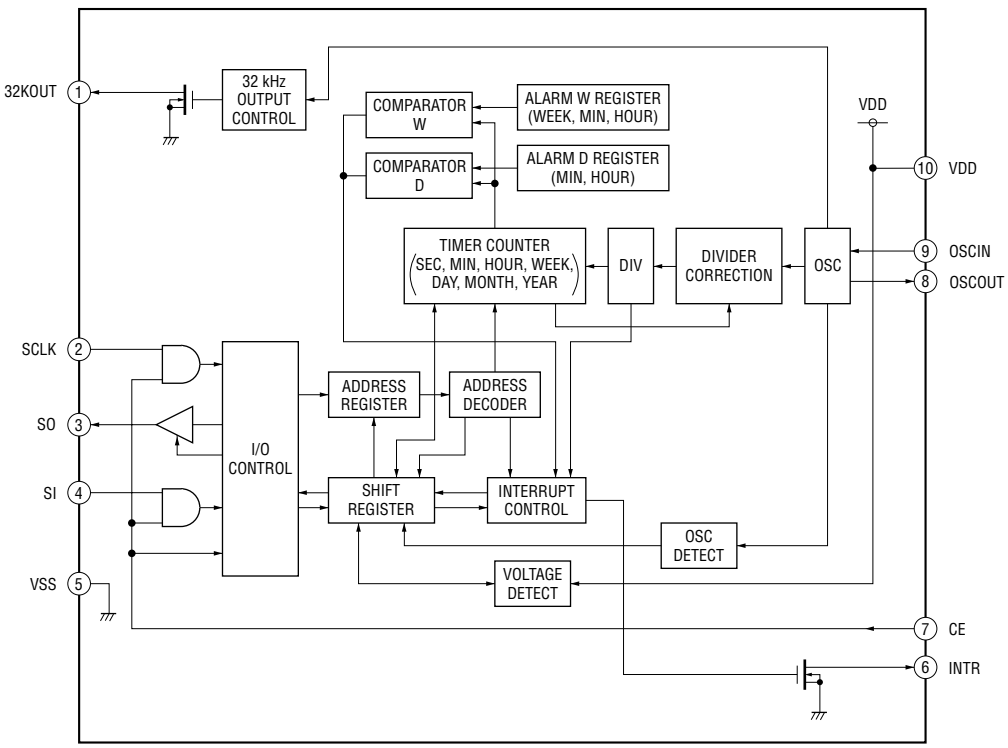


● **IC Block Diagrams (DIGITAL SECTION)**

IC702 TC7S08FU (TE85R)



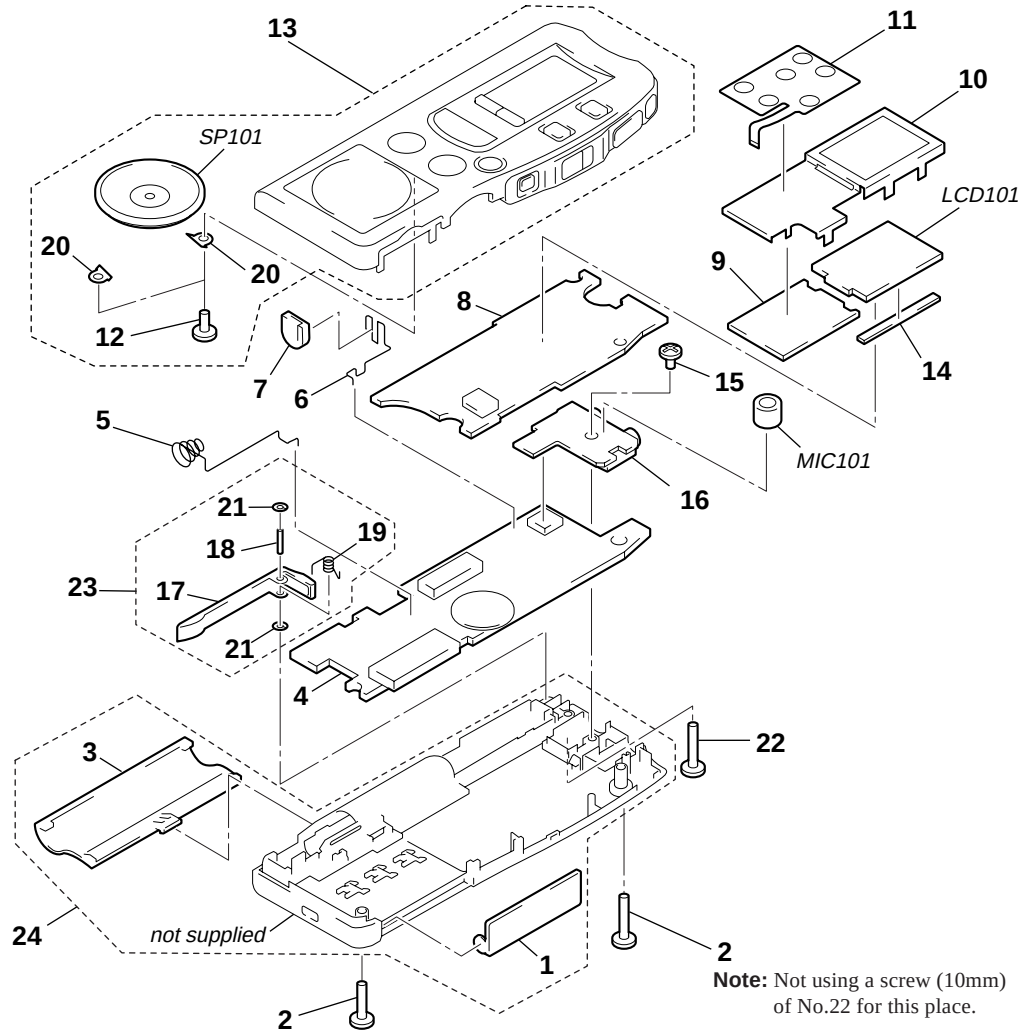
IC706 RS5C348A-E2



SECTION 5
EXPLODED VIEW

NOTE :

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " * "are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Aaccessories and packing materials are given in the last of this parts list.



Note: Not using a screw (10mm) of No.22 for this place.

Ref. No.	Part No.	Description	Remark
1	4-217-035-01	CAP(PC)	
2	3-318-203-91	SCREW(B1.7X9), TAPPING	
3	4-217-034-01	LID,BATTERY CASE	
4	A-3321-888-A	MAIN BOARD, COMPLETE	
5	4-217-039-01	TERMINAL (-), BATTERY	
6	4-217-038-01	TERMINAL (+), BATTERY	
7	4-217-040-01	CAP(TERMINAL)	
8	A-3321-891-A	DIGITAL BOARD, COMPLETE	
9	4-218-499-01	PLATE, LIGHT GUIDE	
10	4-217-031-01	HOLDER, LCD	
11	1-418-318-11	UNIT, SWITCH	
12	3-375-114-41	SCREW	
13	X-4951-072-1	LID ASSY, UPPER	
14	1-694-521-11	CONDUCTIVE BOARD, CONECTION	
15	3-318-382-71	SCREW (1.7X4), TAPPING	
16	1-673-294-11	JACK BOARD	
17	4-217-036-01	CLIP	
18	4-217-864-01	SHAFT (CLIP)	
19	4-217-037-01	SPRING (CLIP)	
20	4-217-032-01	RETAINER, SPEAKER	
21	3-349-859-41	WASHER	
22	3-334-565-01	SCREW(B1.7X10), TAPPING	
23	X-4951-795-1	CLIP ASSY	
24	X-4951-073-1	CASE ASSY	
LCD101	1-803-522-11	DISPLAY PANEL, LIQUID CRYSTAL	
MIC101	1-542-384-11	MICROPHONE, ELECTRET CONDENSER	
SP101	1-505-854-11	SPEAKER (2.8cm)	

DIGITAL

SECTION 6
ELECTRICAL PARTS LIST

NOTE :

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL : Metal-film resistor
  METAL OXIDE :Metal oxide-film resistor
  F : nonflammable
- Items marked " * "are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u : μ , for example :
  uA.... : μ A.... , uPA.... : μ PA....
  uPB.... : μ PB.... , uPC.... : μ PC....
  uPD.... : μ PD....
- CAPACITORS
  uF : μ F
- COILS
  uH : μ H

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description			Remark
	A-3321-891-A	DIGITAL BOARD, COMPLETE			
		**********			
	1-418-318-11	UNIT,SWITCH			
	1-694-521-11	CONDUCTIVE BOARD, CONECTION			
	4-217-031-01	HOLDER, LCD			
	4-218-499-01	PLATE, LIGHT GUIDE			
		<CAPACITOR>			
C501	1-107-826-11	CERAMIC CHIP	0.1uF		16V
C504	1-110-569-11	TANTAL. CHIP	47uF	20%	6.3V
C701	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C702	1-104-913-91	TANTAL. CHIP	10uF	20%	16V
C704	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C708	1-113-988-11	TANTAL. CHIP	68uF	20%	4V
C709	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C711	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V
C712	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C715	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C721	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C726	1-162-921-91	CERAMIC CHIP	33PF		
C727	1-162-921-91	CERAMIC CHIP	33PF		
		<CONNECTOR>			
* CN704	1-785-876-21	CONNECTOR, FPC			
* CN705	1-785-874-21	PLUG, BOARD TO BOARD 50P			
		<DIODE>			
D502	8-719-073-33	LED CL-165HR/YG-D-T (OPR)			
D503	8-719-070-68	DIODE CL-220YG-C-TS (LCD BACK LIGHT)			
D504	8-719-070-68	DIODE CL-220YG-C-TS (LCD BACK LIGHT)			
D701	8-719-016-74	DIODE 1SS352			
		<FERRITEBEAD>			
FB702	1-414-921-11	INDUCTOR CHIP			
FB703	1-414-921-11	INDUCTOR CHIP			
		<JUMPERREGISTOR>			
JC701	1-216-864-11	METAL CHIP	0	5%	1/16W
JC702	1-216-864-11	METAL CHIP	0	5%	1/16W
		<IC>			
IC501	8-759-333-42	IC XC61AN3002MR			

Ref. No.	Part No.	Description			Remark
IC505	8-759-497-27	IC XC62AP2102MR			
IC701	8-759-583-36	IC KM29U128T			
IC702	8-759-058-62	IC TC7S08FU(TE85R)			
IC703	8-759-058-58	IC TC7S04FU(TE85R)			
IC704	8-759-579-98	IC uPD780308GC-113-8EU			
IC706	8-759-560-17	IC RS5C348A-E2			
		<LIQUIDCRYSTALDISPLAY PANEL>			
LCD101	1-803-522-11	DISPLAY PANEL, LIQUID CRYSTAL			
		<TRANSISTOR>			
Q501	8-729-426-25	TRANSISTOR XP1212			
Q503	8-729-402-32	TRANSISTOR 2SD1819A-R			
Q701	8-729-037-74	TRANSISTOR UN9213J-(TX).SO			
Q702	8-729-420-24	TRANSISTOR 2SB1218A-QRS			
Q703	8-729-420-24	TRANSISTOR 2SB1218A-QRS			
		<RESISTOR>			
R501	1-216-845-11	METAL CHIP	100K	5%	1/16W
R502	1-216-821-11	METAL CHIP	1K	5%	1/16W
R503	1-216-817-11	METAL CHIP	470	5%	1/16W
R505	1-216-821-11	METAL CHIP	1K	5%	1/16W
R507	1-216-833-91	RES,CHIP	10K	5%	1/16W
R508	1-216-793-11	RES,CHIP	5	5%	1/16W
R513	1-216-809-11	METAL CHIP	100	5%	1/16W
R701	1-216-845-11	METAL CHIP	100K	5%	1/16W
R702	1-216-845-11	METAL CHIP	100K	5%	1/16W
R703	1-216-857-11	METAL CHIP	1M	5%	1/16W
R704	1-216-854-11	METAL CHIP	560K	5%	1/16W
R711	1-216-849-11	METAL CHIP	220K	5%	1/16W
R712	1-216-849-11	METAL CHIP	220K	5%	1/16W
R713	1-216-857-11	METAL CHIP	1M	5%	1/16W
R714	1-216-854-11	METAL CHIP	560K	5%	1/16W
R715	1-216-849-11	METAL CHIP	220K	5%	1/16W
R719	1-218-871-11	RES,CHIP	10K	0.50%	1/16W
R720	1-218-875-11	RES,CHIP	15K	0.50%	1/16W
R721	1-216-855-11	METAL CHIP	680K	5%	1/16W
R722	1-216-821-11	METAL CHIP	1K	5%	1/16W
R723	1-216-821-11	METAL CHIP	1K	5%	1/16W
R728	1-216-831-91	METAL CHIP	10K	5%	1/16W
R729	1-218-879-11	RES,CHIP	22K	0.50%	1/16W
R730	1-218-887-11	METAL CHIP	47K	0.50%	1/16W
R731	1-216-855-11	METAL CHIP	680K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R734	1-216-833-91	RES,CHIP	10K	5%	1/16W
R737	1-216-853-11	METAL CHIP	470K	5%	1/16W
R738	1-216-833-91	RES,CHIP	10K	5%	1/16W
R739	1-216-833-91	RES,CHIP	10K	5%	1/16W
R740	1-216-833-91	RES,CHIP	10K	5%	1/16W
R741	1-216-833-91	RES,CHIP	10K	5%	1/16W
R742	1-216-845-11	METAL CHIP	100K	5%	1/16W
R744	1-216-853-11	METAL CHIP	470K	5%	1/16W
R745	1-216-821-11	METAL CHIP	1K	5%	1/16W
R747	1-216-845-11	METAL CHIP	100K	5%	1/16W
R764	1-216-845-11	METAL CHIP	100K	5%	1/16W
R766	1-216-857-11	METAL CHIP	1M	5%	1/16W
		<SWITCH>			
S701	1-771-585-11	SWITCH, PUSH (1 KEY) (● REC/STOP)			
S702	1-762-366-11	SWITCH, TACTILE (FILE)			
S703	1-762-366-11	SWITCH, TACTILE (INDEX)			
S704	1-771-585-11	SWITCH, PUSH (1 KEY) (ERASE)			
S711	1-771-248-11	SWITCH, TACTILE (❚❚ PAUSE)			
S712	1-572-922-11	SWITCH, SLIDE (HOLD)			
		<VIBRATOR>			
* X701	1-767-994-22	VIBRATOR, CRYSTAL (32.768kHz)			
X702	1-767-144-21	VIBRATOR, CERAMIC (5MHz)			
**********					
	1-673-294-11	JACK BOARD			
		**********			
		<CONNECTOR>			
* CN101	1-785-873-21	CONNECTOR, BOARD TO BOARD 10P			
		<JACK>			
J101	1-784-848-21	JACK (MIC (PLUG-IN POWER))			
J102	1-785-869-21	JACK (EARPHONE)			
**********					
	A-3321-888-A	MAIN BOARD, COMPLETE			
		**********			
		<CAPACITOR>			
C101	1-104-913-11	TANTAL. CHIP	10uF	20%	10V
C102	1-115-156-11	CERAMIC CHIP	1uF		10V
C103	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C104	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C105	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C106	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C107	1-113-600-11	TANTAL. CHIP	2.2uF	20%	6.3V
C108	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C109	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C110	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C111	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C112	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C114	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C116	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C118	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V

Ref. No.	Part No.	Description			Remark
C124	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C125	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C126	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C127	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C128	1-125-926-91	TANTAL. CHIP	4.7uF	20%	6.3V
C129	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C130	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C131	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C133	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C134	1-109-847-11	TANTAL. CHIP	0.47uF	20%	16V
C136	1-117-370-11	CERAMIC CHIP	10uF		10V
C137	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V
C139	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C140	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C141	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C142	1-164-471-11	CERAMIC CHIP	680PF	5%	50V
C143	1-164-471-11	CERAMIC CHIP	680PF	5%	50V
C144	1-164-471-11	CERAMIC CHIP	680PF	5%	50V
C145	1-164-471-11	CERAMIC CHIP	680PF	5%	50V
C146	1-164-360-11	CERAMIC CHIP	0.1uF		16V
* C147	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C148	1-115-156-11	CERAMIC CHIP	1uF		10V
C149	1-109-847-11	TANTAL. CHIP	0.47uF	20%	16V
C151	1-117-370-11	CERAMIC CHIP	10uF		10V
C152	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C153	1-107-726-91	CERAMIC CHIP	0.01uF	10%	16V
C154	1-107-726-91	CERAMIC CHIP	0.01uF	10%	16V
C155	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C156	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C157	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C158	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C160	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C161	1-162-957-91	CERAMIC CHIP	220PF	5%	50V
C162	1-164-471-11	CERAMIC CHIP	680PF	5%	50V
C502	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C505	1-110-569-11	TANTAL. CHIP	47uF	20%	6.3V
C506	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C508	1-117-370-11	CERAMIC CHIP	10uF		10V
C509	1-128-829-91	TANTAL. CHIP	220uF	20%	6.3V
C510	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C512	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C513	1-117-370-11	CERAMIC CHIP	10uF		10V
C710	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C716	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C717	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C718	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V
C719	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C722	1-104-851-91	TANTAL. CHIP	10uF	20%	10V
* C723	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
* C724	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C725	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C730	1-107-726-91	CERAMIC CHIP	0.01uF	10%	16V
		<CONNECTOR>			
* CN102	1-785-872-21	PLUG, BOARD TO BOARD 10P			
CN701	1-785-871-21	CONNECTOR, PC LINK (DIGITAL I/O)			
* CN703	1-785-875-21	CONNECTOR, BOARD TO BOARD 50P			

MAIN

Ref. No.	Part No.	Description	Remark
		<DIODE>	
D501	8-719-073-35	DIODE RB551V-30TE-17	
		<FERRITEBEAD>	
FB101	1-414-593-21	FERRITE BEAD INDUCTOR	
FB102	1-414-593-21	FERRITE BEAD INDUCTOR	
FB103	1-414-593-21	FERRITE BEAD INDUCTOR	
FB104	1-414-593-21	FERRITE BEAD INDUCTOR	
FB105	1-414-593-21	FERRITE BEAD INDUCTOR	
FB106	1-414-593-21	FERRITE BEAD INDUCTOR	
FB107	1-414-593-21	FERRITE BEAD INDUCTOR	
FB501	1-414-921-11	INDUCTOR 2.2uH	
FB503	1-414-921-11	INDUCTOR 2.2uH	
FB701	1-414-921-11	INDUCTOR 2.2uH	
		<IC>	
IC101	8-759-567-09	IC MSM7590L-01TS-K	
IC102	8-759-567-10	IC XC25A08510MR	
IC103	8-759-574-34	IC LMV358MMX	
IC104	8-759-701-51	IC NJM2072M	
IC105	8-759-582-03	IC NJM2149V-TE2	
IC106	8-759-082-60	IC TC7S66FU	
IC107	8-759-358-47	IC NJM2115V(TE2)	
IC108	8-759-582-03	IC NJM2149V-TE2	
IC109	8-759-586-57	IC AN6123MS	
IC502	8-759-583-76	IC XC62GR3522MR	
IC503	8-759-582-02	IC XC6372C381PR	
IC504	8-759-592-24	IC XC61AN1502MR	
IC506	8-759-583-76	IC XC62GR3522MR	
IC705	8-759-288-49	IC XC61AN2202MR	
IC707	8-759-592-25	IC CXD9519TQ	
IC708	8-759-583-76	IC XC62GR3522MR	
IC709	8-759-058-62	IC TC7S08FU(TE85R)	
IC710	8-759-333-42	IC XC61AN3002MR	
IC777	8-759-710-84	IC NJM2406F-TE2	
		<COIL>	
L501	1-469-395-21	INDUCTOR	
L503	1-414-752-11	INDUCTOR 2.2uH	
		<TRANSISTOR>	
Q101	8-729-429-44	TRANSISTOR XP1501	
Q102	8-729-037-63	TRANSISTOR UN9115J-(TX).SO	
Q103	8-729-429-50	TRANSISTOR XP4312	
Q105	8-729-039-57	TRANSISTOR DTC363EKT146	
Q108	8-729-048-59	TRANSISTOR XC161A1265PR	
Q109	8-729-037-76	TRANSISTOR UN9215J-(TX).SO	
Q110	8-729-037-76	TRANSISTOR UN9215J-(TX).SO	
Q502	8-729-427-74	TRANSISTOR XP4601	
Q704	8-729-037-63	TRANSISTOR UN9115J-(TX).SO	
Q777	8-729-037-63	TRANSISTOR UN9115J-(TX).SO	
		<RESISTOR>	
R102	1-216-829-11	METAL CHIP 4.7K 5%	1/16W
R103	1-216-815-11	METAL CHIP 330 5%	1/16W
R104	1-216-839-11	METAL CHIP 33K 5%	1/16W
R105	1-216-833-91	RES,CHIP 10K 5%	1/16W
R106	1-216-821-11	METAL CHIP 1K 5%	1/16W
R107	1-216-829-11	METAL CHIP 4.7K 5%	1/16W
R108	1-216-821-11	METAL CHIP 1K 5%	1/16W
R109	1-216-841-11	METAL CHIP 47K 5%	1/16W
R110	1-216-829-11	METAL CHIP 4.7K 5%	1/16W
R111	1-216-841-11	METAL CHIP 47K 5%	1/16W
R112	1-216-841-11	METAL CHIP 47K 5%	1/16W
R113	1-216-827-11	METAL CHIP 3.3K 5%	1/16W
R116	1-216-833-91	RES,CHIP 10K 5%	1/16W
R117	1-216-833-91	RES,CHIP 10K 5%	1/16W
R118	1-216-825-11	METAL CHIP 2.2K 5%	1/16W
R120	1-216-845-11	METAL CHIP 100K 5%	1/16W
R121	1-216-845-11	METAL CHIP 100K 5%	1/16W
R122	1-209-926-11	METAL CHIP 36K 5%	1/16W
R131	1-216-835-11	METAL CHIP 15K 5%	1/16W
R132	1-216-831-11	METAL CHIP 6.8K 5%	1/16W
R133	1-216-833-91	RES,CHIP 10K 5%	1/16W
R134	1-216-841-11	METAL CHIP 47K 5%	1/16W
R135	1-216-841-11	METAL CHIP 47K 5%	1/16W
R136	1-216-837-11	METAL CHIP 22K 5%	1/16W
R137	1-216-849-11	METAL CHIP 220K 5%	1/16W
R138	1-216-833-91	RES,CHIP 10K 5%	1/16W
R139	1-216-839-11	METAL CHIP 33K 5%	1/16W
R140	1-216-845-11	METAL CHIP 100K 5%	1/16W
R141	1-216-837-11	METAL CHIP 22K 5%	1/16W
R142	1-216-853-11	METAL CHIP 470K 5%	1/16W
R143	1-209-926-11	METAL CHIP 36K 5%	1/16W
R144	1-218-292-11	RES,CHIP 20K 5%	1/16W
R145	1-216-833-91	RES,CHIP 10K 5%	1/16W
R146	1-218-292-11	RES,CHIP 20K 5%	1/16W
R147	1-216-817-11	METAL CHIP 470 5%	1/16W
R148	1-216-824-11	METAL CHIP 1.8K 5%	1/16W
R149	1-216-837-11	METAL CHIP 22K 5%	1/16W
R150	1-216-837-11	METAL CHIP 22K 5%	1/16W
R151	1-216-853-11	METAL CHIP 470K 5%	1/16W
R152	1-216-849-11	METAL CHIP 220K 5%	1/16W
R153	1-216-833-91	RES,CHIP 10K 5%	1/16W
R154	1-216-845-11	METAL CHIP 100K 5%	1/16W
R155	1-216-825-11	METAL CHIP 2.2K 5%	1/16W
R156	1-216-797-11	METAL CHIP 10 5%	1/16W
R157	1-216-797-11	METAL CHIP 10 5%	1/16W
R160	1-216-825-11	METAL CHIP 2.2K 5%	1/16W
R161	1-216-821-11	METAL CHIP 1K 5%	1/16W
R162	1-216-799-11	METAL CHIP 15 5%	1/16W
R163	1-216-835-91	RES,CHIP 15K 5%	1/16W
R164	1-216-827-11	METAL CHIP 3.3K 5%	1/16W
R166	1-216-857-11	METAL CHIP 1M 5%	1/16W
R167	1-216-833-91	RES,CHIP 10K 5%	1/16W
R171	1-216-813-91	METAL CHIP 220 5%	1/16W
R504	1-216-853-11	METAL CHIP 470K 5%	1/16W
R506	1-216-853-11	METAL CHIP 470K 5%	1/16W
R509	1-216-857-11	METAL CHIP 1M 5%	1/16W
R510	1-216-849-11	METAL CHIP 220K 5%	1/16W
R511	1-218-895-11	RES,CHIP 100K 0.50%	1/16W
R512	1-218-895-11	RES,CHIP 100K 0.50%	1/16W
R514	1-216-845-11	METAL CHIP 100K 5%	1/16W
R515	1-216-864-11	METAL CHIP 0 5%	1/16W
R724	1-216-855-11	METAL CHIP 680K 5%	1/16W
R725	1-216-821-11	METAL CHIP 1K 5%	1/16W

Ref. No.	Part No.	Description			Remark
R726	1-216-849-11	METAL CHIP	220K	5%	1/16W
R727	1-216-849-11	METAL CHIP	220K	5%	1/16W
R733	1-216-845-11	METAL CHIP	100K	5%	1/16W
R743	1-216-833-91	RES,CHIP	10K	5%	1/16W
R732	1-216-845-11	METAL CHIP	100K	5%	1/16W
R749	1-216-845-11	METAL CHIP	100K	5%	1/16W
R750	1-216-833-91	RES,CHIP	10K	5%	1/16W
R751	1-216-845-11	METAL CHIP	100K	5%	1/16W
R752	1-216-833-91	RES,CHIP	10K	5%	1/16W
R753	1-216-833-91	RES,CHIP	10K	5%	1/16W
R754	1-216-813-91	METAL CHIP	220	5%	1/16W
R755	1-216-813-91	METAL CHIP	220	5%	1/16W
R756	1-216-837-11	METAL CHIP	22K	5%	1/16W
R758	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R761	1-216-821-11	METAL CHIP	1K	5%	1/16W
R762	1-216-841-11	METAL CHIP	47K	5%	1/16W
R763	1-216-833-91	RES,CHIP	10K	5%	1/16W
R764	1-216-845-11	METAL CHIP	100K	5%	1/16W
R765	1-216-849-11	METAL CHIP	220K	5%	1/16W
		<COMPOSITIONCIRCUIT BLOCK >			
RB701	1-233-957-11	RES, NETWORK (CHIP TYPE) 220			
RB702	1-233-957-11	RES, NETWORK (CHIP TYPE) 220			
RB704	1-233-961-21	RES, NETWORK (CHIP TYPE) 1K			
RB705	1-233-961-21	RES, NETWORK (CHIP TYPE) 1K			
		<VARIABLERESISTOR >			
RV101	1-225-502-41	RES, VAR, CARBON 10K/10K(◢ VOL)			
		<SWITCH>			
S101	1-572-922-11	SWITCH, SLIDE (MIC SENS)			
S713	1-572-922-11	SWITCH, SLIDE (VOR)			
S714	1-692-605-31	SWITCH, SLIDE (PLAY SPEED)			
**********					
		MISCELLANEOUS			
		**********			
11	1-418-318-11	UNIT, SWITCH			
14	1-694-521-11	CONDUCTIVE BOARD, CONECTION			
LCD101	1-803-522-11	DISPLAY PANEL, LIQUID CRYSTAL			
MIC101	1-542-384-11	MICROPHONE, ELECTRET CONDENSER			
SP101	1-505-854-11	SPEAKER (2.8cm)			
**********					
		ACCESSORIES&PACKING MATERIALS			
		**********			
	4-217-041-01	CASE,CARRYING			
	3-866-532-61	MANUAL, INSTRUCTION (ENGLISH,KOREAN, CHINESE)			

9-926-975-11

Sony Corporation
Personal A&V Products Company

99C02031-1
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Published by Quality Engineering Dept.
(Shinagawa)

ICD-R100

SERVICE MANUAL

Ver 1.1 1999.06

US Model
AEP Model
Tourist Model

SPECIFICATIONS

Recording media
Built-in flash memory, Monaural recording
Recording time
SP: 64 minutes
LP: 150 minutes
Frequency response
SP: 280 Hz - 4,800 Hz
LP: 240 Hz - 2,800 Hz
Speaker approx. 2.8 cm dia.
Power output
110 mW
Input/Output
- Earphone jack (mini jack) for 8 - 300 ohms earphone/headphones
- Microphone jack (mini jack, monaural)
  Plug in power
  Minimum input level
  0.5 mV
  3 kilohms or lower impedance microphone
- Digital I/O connector (15-pin)

Playback speed control
LP mode: FAST +30%
SLOW –15%
SP mode: FAST +20%
SLOW –15%

Power requirements
Two size AAA (LR03) alkaline batteries: 3 V DC
Dimensions (w/h/d)
(not incl. projecting parts and controls)
44.4 × 100.5 × 12.5 mm
Mass (incl. batteries)
68 g
Supplied accessories
Size AAA (LR03) alkaline battery × 2
Carrying case × 1

Design and specifications are subject to change without notice.

IC RECORDER

MICROFILM

SONY®

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6. ELECTRICAL PARTS LIST 25

Flexible Circuit Board Repairing

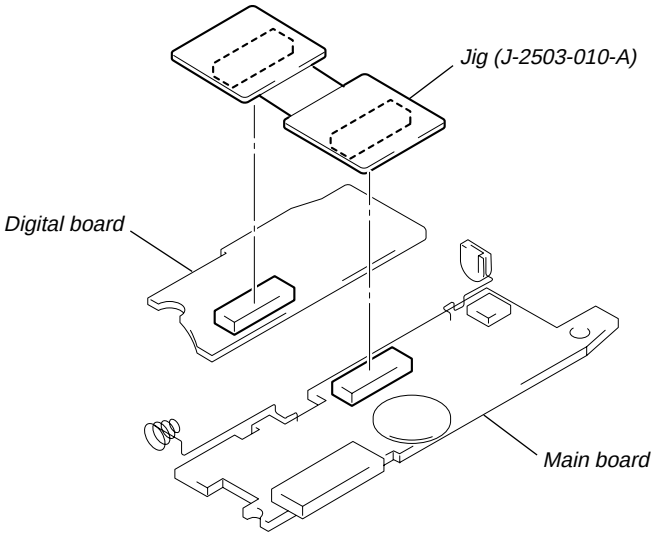
- Keep the temperature of the soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

SECTION 1
SERVICING NOTE

Using the special connector jig (J-2503-101-A) to connect the main board and digital board will prove convenient when servicing the unit with power applied.



Note : Do not apply excessive amounts of flux during replacement of electronic components since this may cause electrical shorts due to moisture.
Wipe off flux after electronic components exchange.

CAUTION ON REPLACING FLASH MEMORY

The BAD-BLOCK check* must be executed, when the flash memory (IC701) in this set was replaced.
The set will not operation normally, unless this check is finished.

* The BAD-BLOCK check detects an area (bad-block) in the flash memory where data validity cannot be guaranteed, and saves this information in the TOC-AREA so that a bad-block is not used.

BAD-BLOCK check procedure :

1. Apply 3V from regulated power supply to the battery terminals.
2. Once the power is supplied, the check starts and then proceeds for approx. 3 minutes. (Be sure to keep applying the power during the check)
3. When the check completes, the result is shown as bellows.
   OK : Only the LCD back light LED (D503, 504) turns on.
   NG : Red LED blinks or turns on or green LED turns on in the OPR LED (D502),
4. In case of OK, press the STOP button.

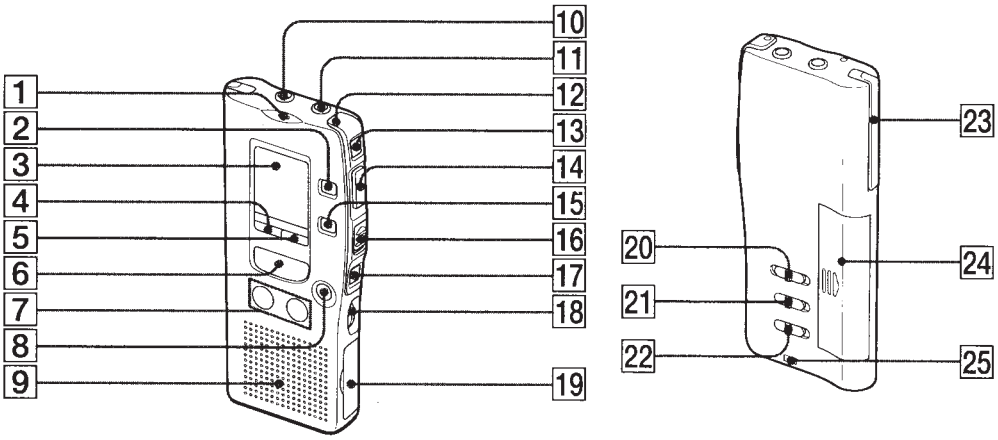
Note :

- In case of NG, check system control IC (IC704), flash memory IC (IC701) and the peripheral circuit. (Particularly, check carefully the soldering of the flash memory)
- After finishing the BAD-BLOCK check, assemble the set, load the dry battery, and confirm if the set operates normally.

SECTION 2
GENERAL

This section is extracted from instruction manual.

LOCATION AND FUNCTION OF CONTROLS

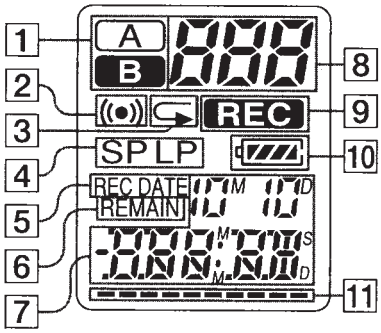


Main unit

1 MIC (built-in microphone)
2 INDEX button
3 Display window
4 DISPLAY button
5 MENU button
6 ►PLAY/STOP•EXECUTE (play/stop•enter) button
7 I◄◄ REVIEW/►►I CUE (fast backward, review/fast forward, cue•selection of menu mode) button
8 ■ STOP button
9 Speaker
10 MIC (PLUG IN POWER) jack
11 EAR (earphone) jack
12 OPR (operation) indicator
13 ❚❚ PAUSE button
14 ● REC (record) /STOP button
15 FILE button
16 HOLD switch
17 ERASE button
18 VOL (volume) control
19 DIGITAL I/O connector
20 PLAY SPEED selector
21 MIC SENS (microphone sensitivity) selector
22 VOR selector
23 Clip*
24 Battery compartment
25 Hook for handstrap (not supplied)

Notes

- To prevent the clip from breaking, avoid hooking it on thick fabric, such as a pocket of a heavy coat.
- When bending down or running with the unit clipped on your pocket, be careful not to drop the unit.



Display window

1 File indication
2 Alarm indicator
3 Repeat play indicator
4 Recording mode indication
5 REC DATE (recording date) indication
6 REMAIN indicator
7 Counter , Remaining time indication, Recording date indication, Current time indication,
Menu indication, Messages
8 Selected file number
Total number of messages in a file
Mode indication of the menu (ON, OFF, etc.)
9 REC (recording) indicator
10 Remaining battery indicator
11 Remaining memory indicator

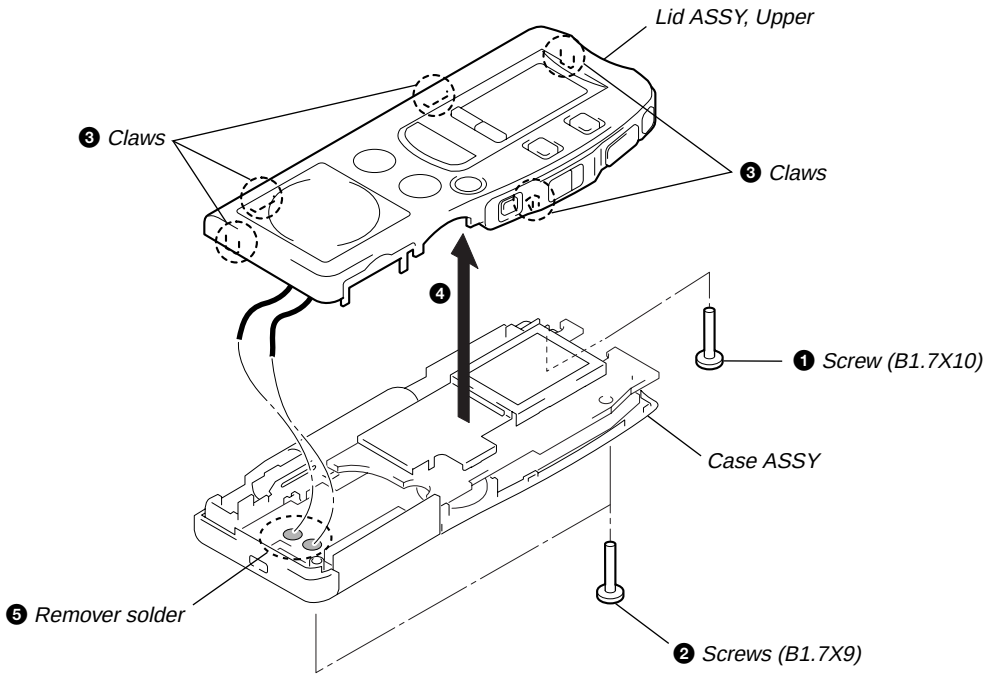
SECTION 3
DISASSEMBLY

● The equipment can be removed using the following procedure.

Set → Lid ASSY, Upper → Digital board → Jack board → Main board
Digital board → Unit, Switch

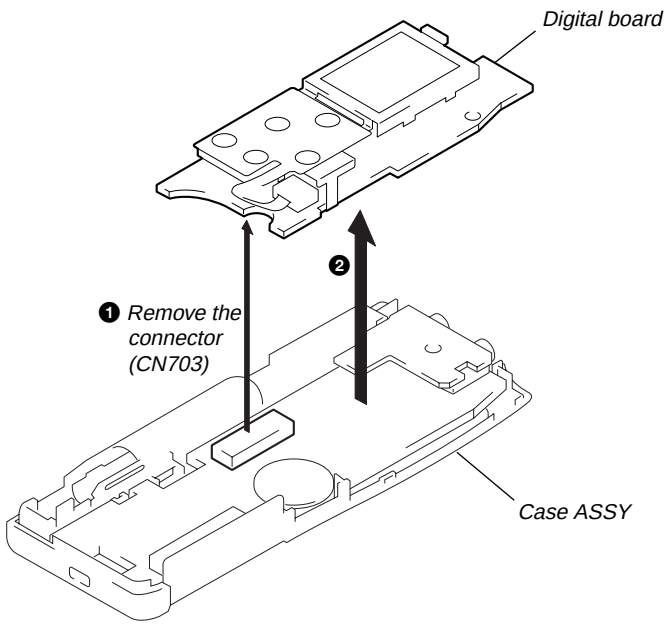
Note : Follow the disassembly procedure in the numerical order given.

3-1. LID ASSY, UPPER

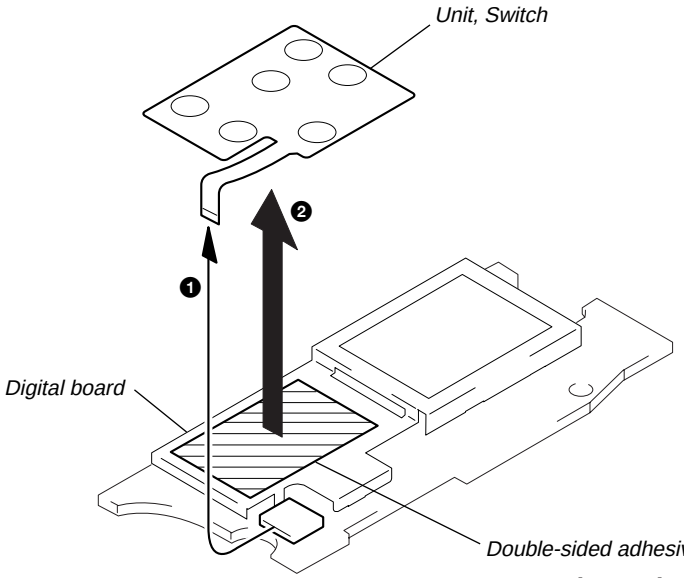


Note : Not using a screw (10mm) of step ❶ for this place.

3-2. DIGITAL BOARD

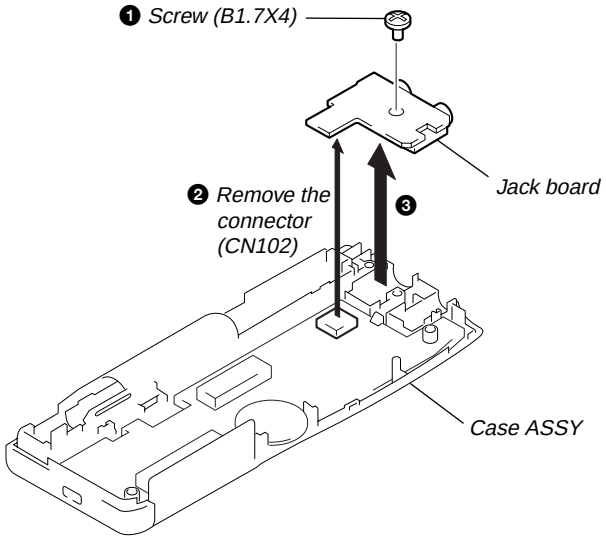


3-3. UNIT, SWITCH

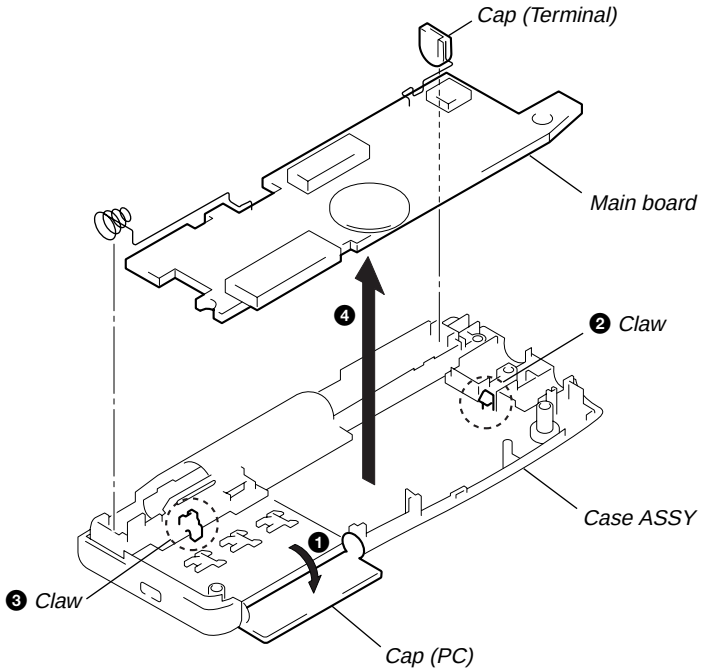


Note : The switch unit is secured with double-sided adhesive tape.
When removed the switch unit, change it for a new component.

3-4. JACK BOARD



3-5. MAIN BOARD



SECTION 4
DIAGRAMS

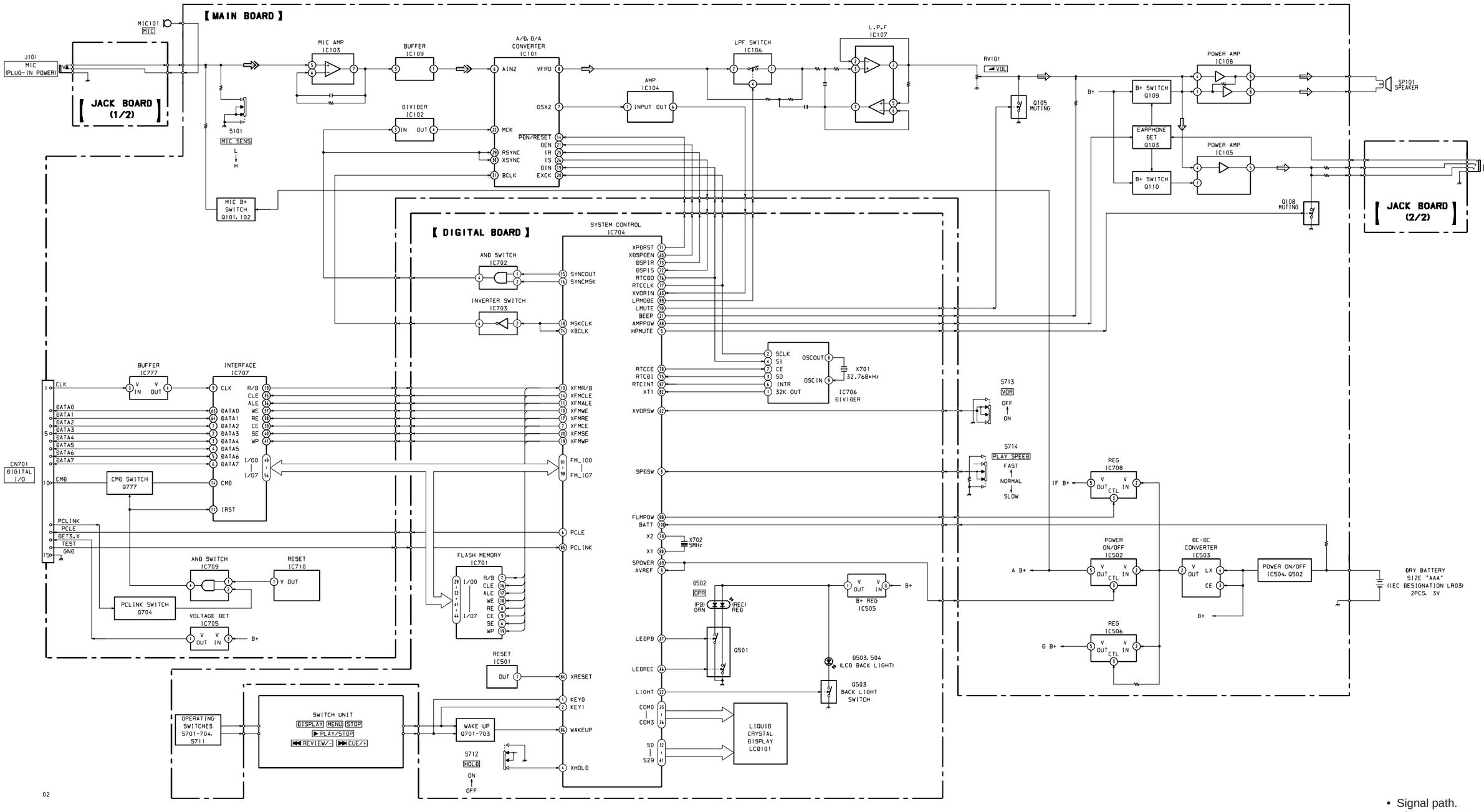
4-1. EXPLANATION OF IC TERMINALS

IC704 μPD780308GC-113-8EU (SYSTEM CONTROL)

Pin No.	Pin name	I/O	Description
1	KEY0	I	Key input
2	KEY1	I	Key input
3	SPDSW	I	Playback speed switch input.
4	XHOLD	I	Hold switch input.
5	HPMUTE	O	Earphone mute output.
6	PCLE	O	PC link permission signal output.
7	XFMCE	O	CE output for flash memory.
8	VDDO	–	Power supply terminal.
9	AVREF	I	A/D reference voltage input.
10	XFMWE	O	Write enable signal output for flash memory.
11	XFMALE	O	ALE signal output.
12	VSS1	–	Ground.
13	XFMR/B	I	Flash memory Ready/Busy signal input.
14	XFMCLE	O	CLE signal output for flash memory.
15	SYNCOUT	O	SYNC signal output.
16	SYNCMSK	O	SYNC output control signal output.
17	XFMRE	O	Flash memory read enable signal output.
18	MSKCLK	I	SYNC output control clock input.
19	XFMWP	O	Flash memory WP signal output.
20	XFMSE	O	Flash memory SE signal output.
21	BEEP	O	BEEP signal output (2.4kHz).
22	LIGHT	O	LCD back lignt control output.
23 – 26	COMO 0–3	O	LCD common signal output.
27	BIAS	–	Connect to VCC (LCD BIAS).
28 – 30	VLC 0 – 2	–	LCD drive power supply.
31	VSS0	–	Ground.
32 – 61	S0 – S29	O	LCD segment signal output.
62	XVORSW	I	VOR switch input.
63	XVORIN	I	VOR signal input.
64	XTEST	I	Test terminal.
65	XDSPDEN	O	DSP registor control I/F enable signal output.
66	LEDREC	O	REC LED (red) ON/OFF output.
67	LEDPB	O	PLAY LED (green) ON/OFF output.
68	AMPPOW	O	Power down control output for IC108.
69	SPOWER	O	IC101 and analog power supply control output.
70	RTCCE	O	Real time colck CE signal output.
71	XPDRST	O	Reset signal output for IC101.
72	DSPIS	I	Serial data input from IC101.
73	DSPIR	O	Playback serial data output for IC101.
74	XBLCK	O	DSP bit clock signal output.
75	RTCDI	I	Real time colck data input.
76	RTCDO	O	RTC data and DSP registor contrl data output.
77	RTCCLK	O	RTC I/F data and DSP registor control clock output.
78	IC	–	Ground.
79	X2	O	System clock output (5MHz).
80	X1	I	System clock input (5MHz).

Pin No.	Pin name	I/O	Description
81	VDD1	–	Power supply terminal.
82	XT1	I	Sub clock input.
83	XT2	I	Sub clock turn over input.
84	XRESET	I	Reset signal input.
85	PCLINK	I	PC link connection detect input.
86	WAKEUP	I	WAKE UP signal input.
87	RTCINT	I	Real time clock (2Hz) signal input.
88	FLMPOW	O	Flash memory and IC707 power ON/OFF.
89	LPMODE	O	LPF switch control output.
90	LMUTE	O	Line mute ON/OFF signal output.
91 – 98	FMIO 0 – 7	I/O	Data bus.
99	AVSS	–	A/D converter ground.
100	BATT	I	Power supply voltage detect input.

4-2. BLOCK DIAGRAMS

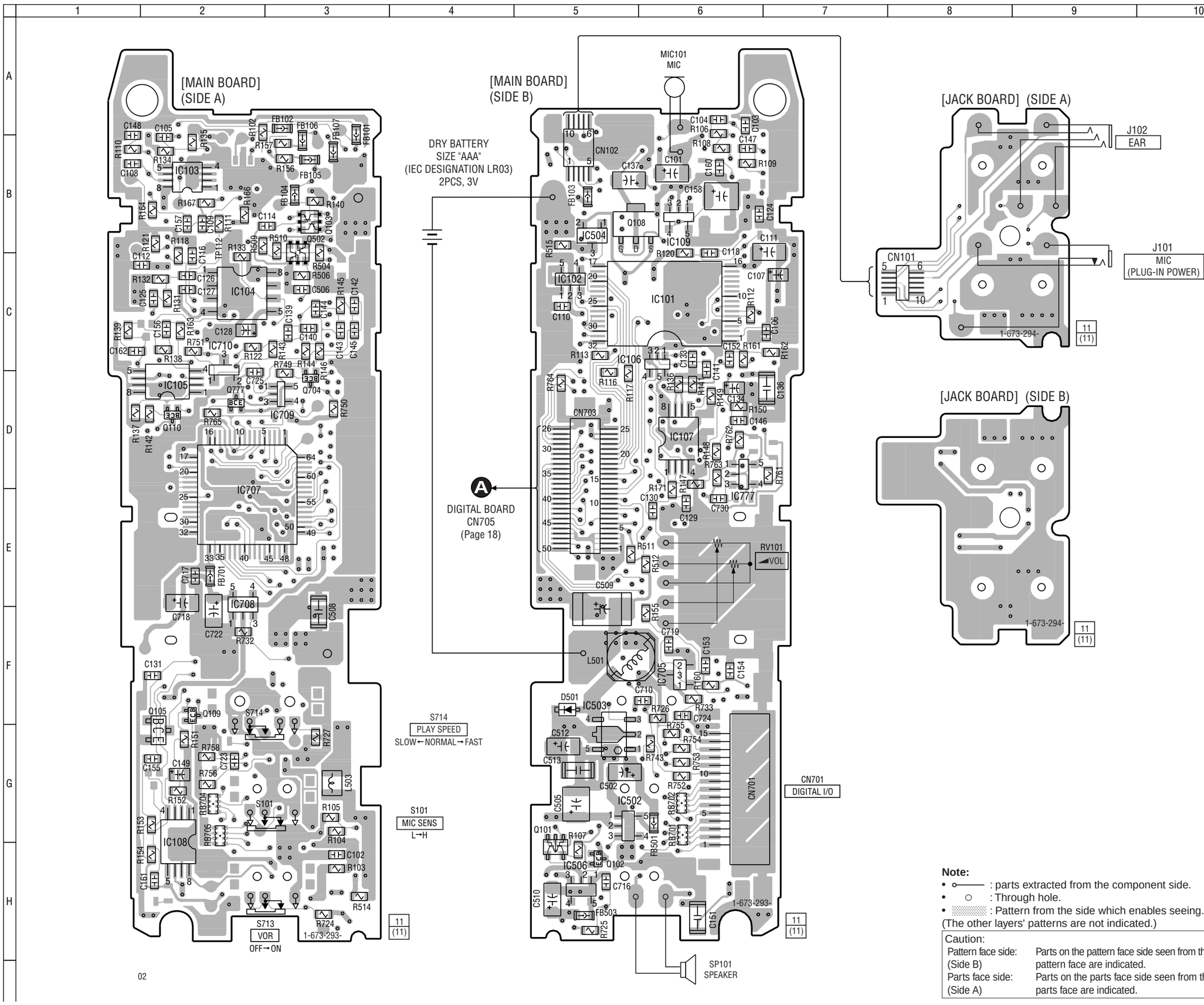


- Signal path.
  ⇨ : PLAY
  ⇨ : REC

4-3. PRINTED WIRING BOARDS (MAIN SECTION)

- **Semiconductor Location**

Ref. No.	Location
D501	F-5
IC101	C-6
IC102	C-5
IC103	B-2
IC104	C-2
IC105	D-2
IC106	C-6
IC107	D-6
IC108	G-2
IC109	B-6
IC502	G-5
IC503	E-5
IC504	B-5
IC506	H-5
IC705	F-6
IC707	E-2
IC708	E-2
IC709	D-3
IC710	C-2
IC777	D-6
Q101	G-5
Q102	H-5
Q103	B-3
Q105	F-2
Q108	B-5
Q109	F-2
Q110	D-2
Q502	B-3
Q704	D-3
Q777	D-2



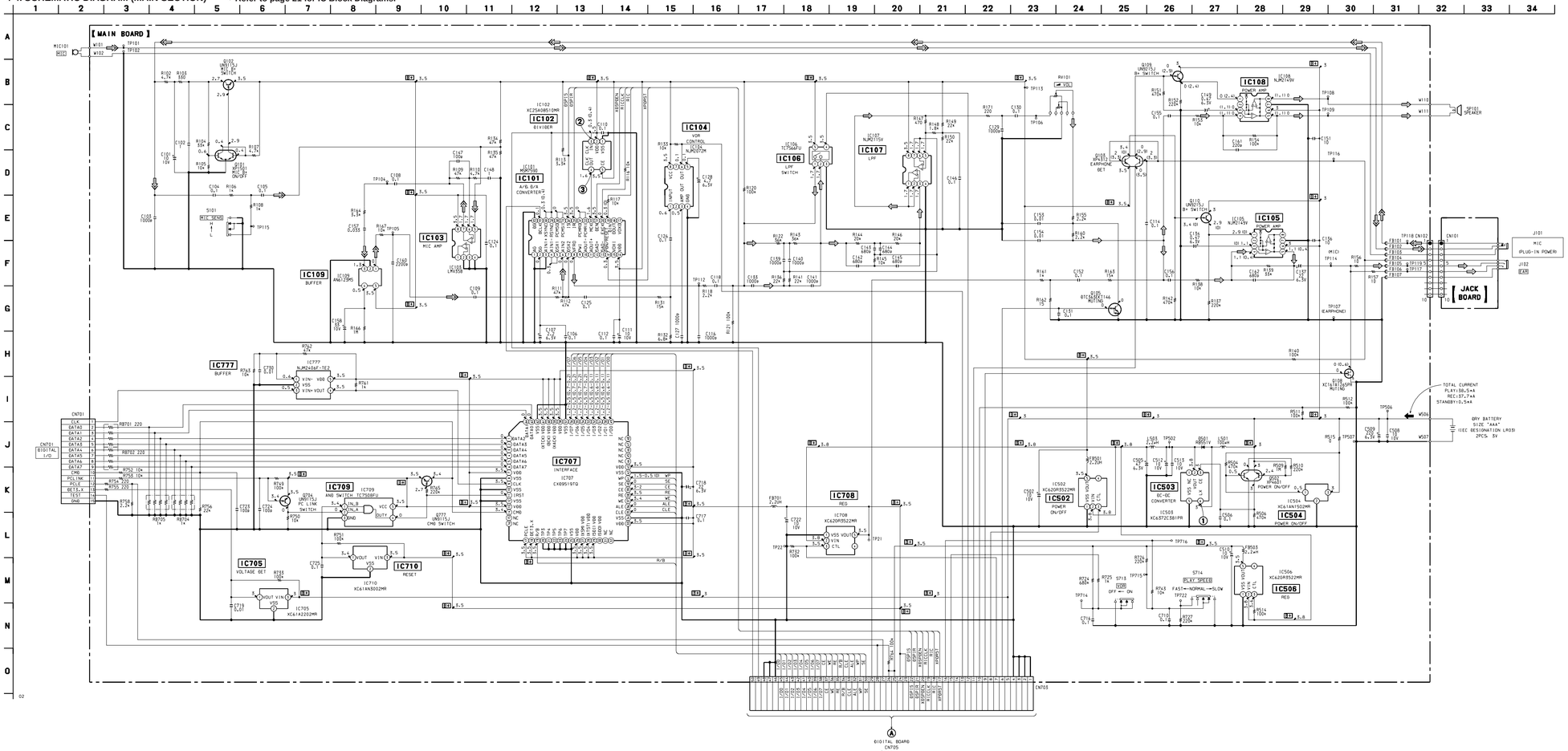
Note:

- ○—— : parts extracted from the component side.
- ○ : Through hole.
- ▒▒ : Pattern from the side which enables seeing.

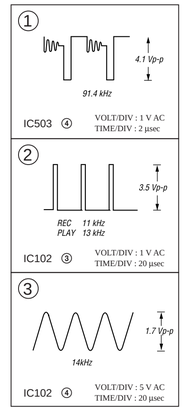
(The other layers' patterns are not indicated.)

Caution:

Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.



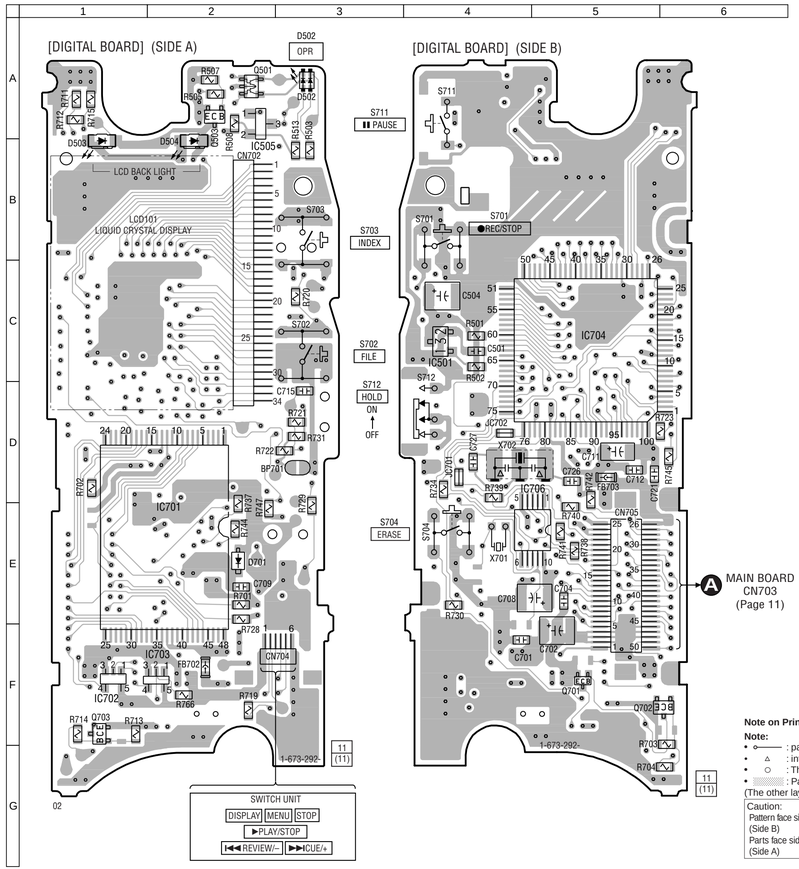
● Waveforms



Note:

- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼ W or less unless otherwise specified.
- B + : B+ Line.
- Power voltage is dc 3V and fed with regulated dc power supply from battery terminal.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark : REC
  ( ) : PLAY
- Voltages and current are taken with a VOM (Input impedance 10 MΩ).
  Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : PLAY
  ⇨ : REC

4-5. PRINTED WIRING BOARDS (DIGITAL SECTION)



● **Semiconductor Location**

Ref. No.	Location
D502	A-3
D503	B-1
D504	B-2
D701	E-2
IC501	C-4
IC505	A-2
IC701	E-2
IC702	F-1
IC703	F-2
IC704	C-5
IC706	E-5
Q501	A-2
Q503	A-2
Q701	F-5
Q702	F-6
Q703	F-1

Note on Printed Wiring Boards:

Note:

- ●——— : parts extracted from the component side.
- △ : internal component.
- ○ : Through hole.
- ▒▒▒ : Pattern from the side which enables seeing.

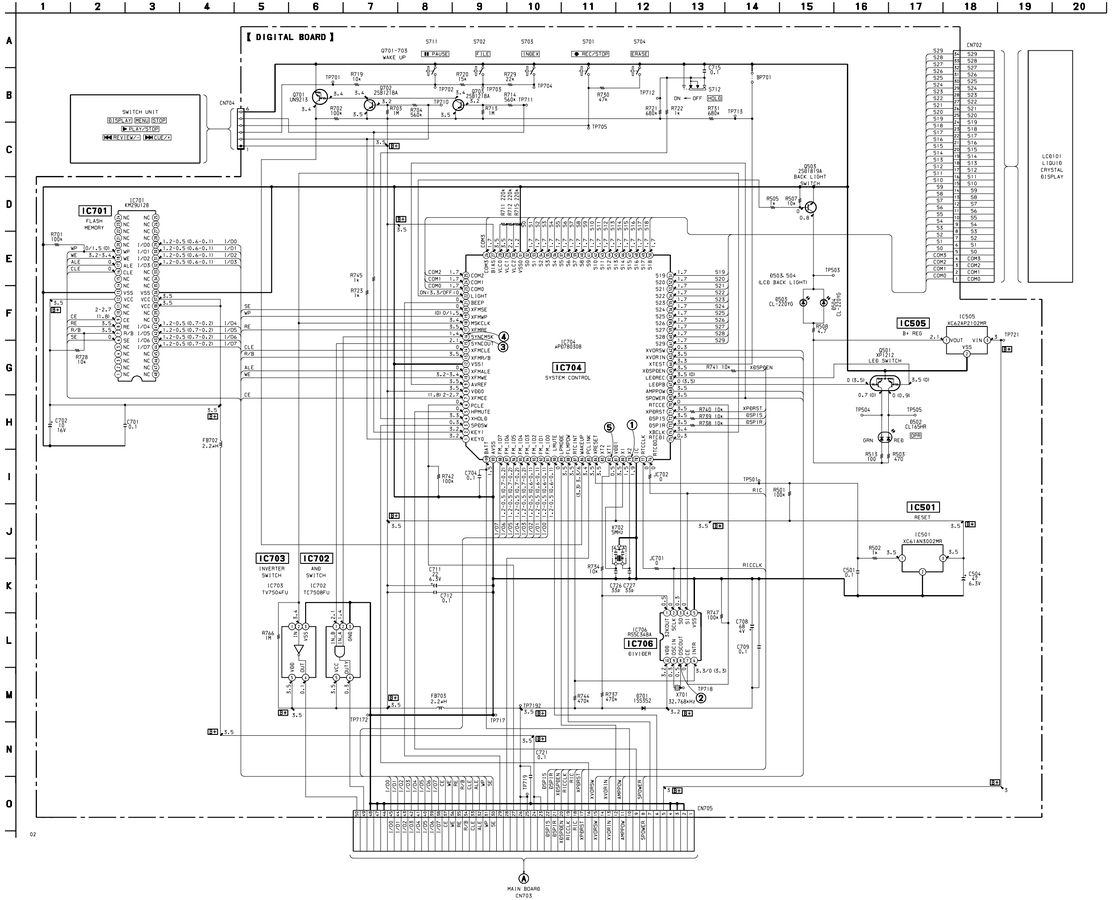
(The other layers' patterns are not indicated.)

Caution:

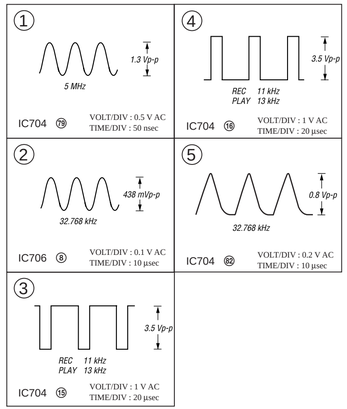
Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.

4-6. SCHEMATIC DIAGRAM (DIGITAL SECTION)

● Refer to page 22 for IC Block Diagrams.



● **Waveforms**

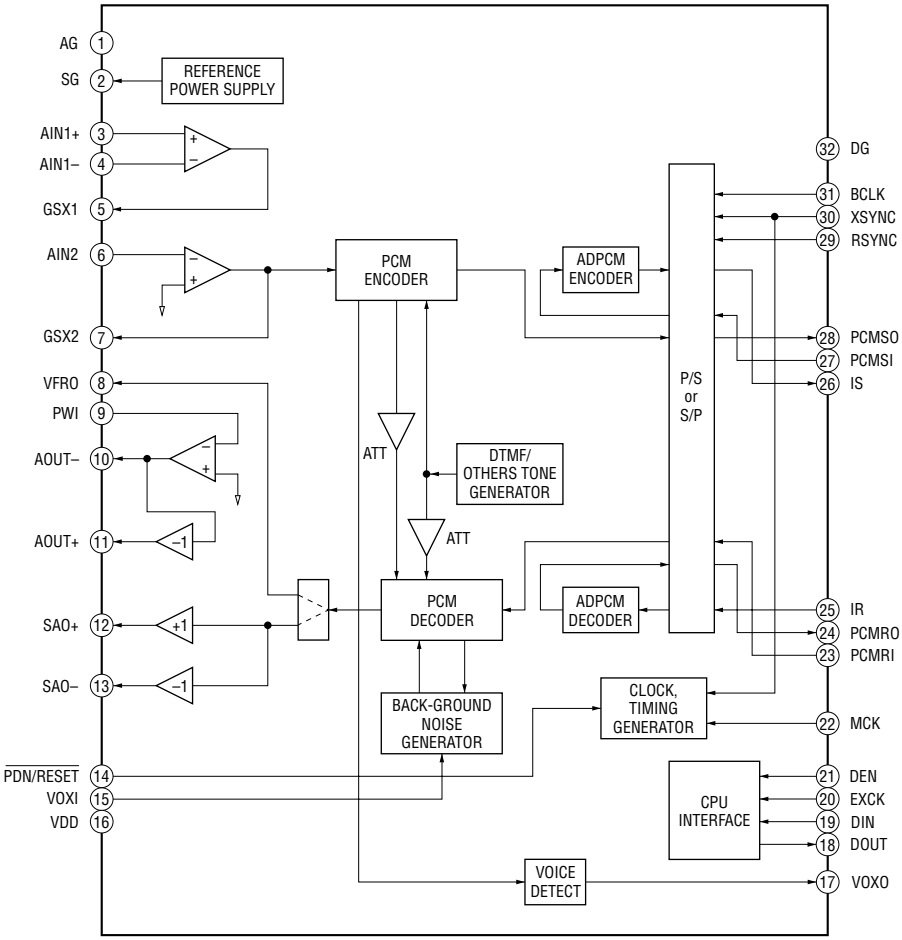


Note:

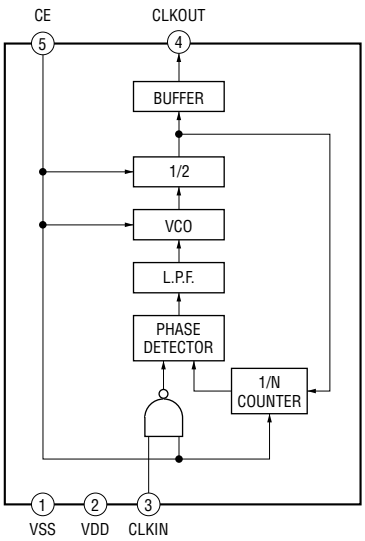
- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- △ : internal component.
- B + : B+ Line.
- Power voltage is dc 3V and fed with regulated dc power supply from battery terminal.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark : REC
  ( ) : PLAY
- Voltages and current are taken with a VOM (Input impedance 10 MΩ).
  Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.

● **IC Block Diagrams (MAIN SECTION)**

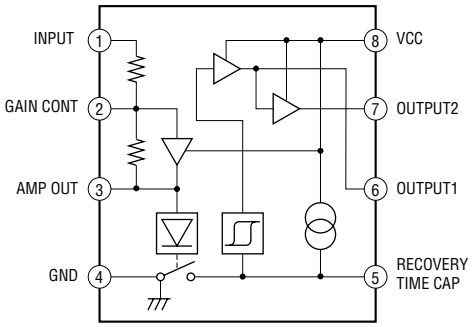
IC101 MSM7590L-01TS-K



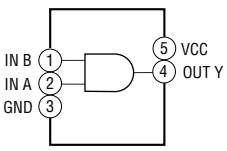
IC102 XC25A08510MR



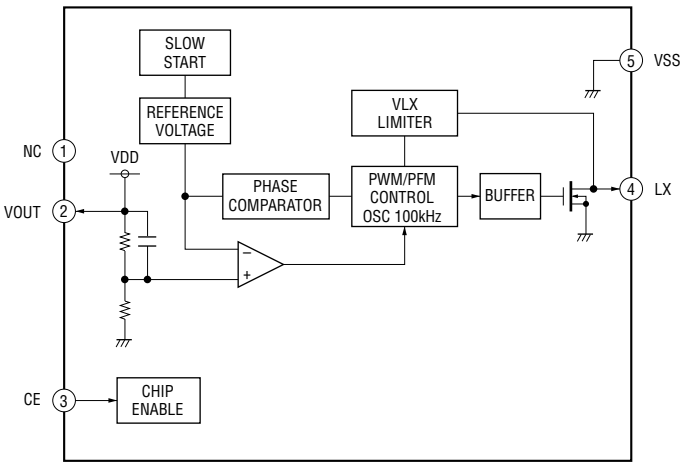
IC104 NJM2072M



IC709 TC7S08FU (TE85R)

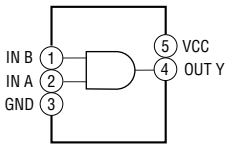


IC503 XC6372C381PR

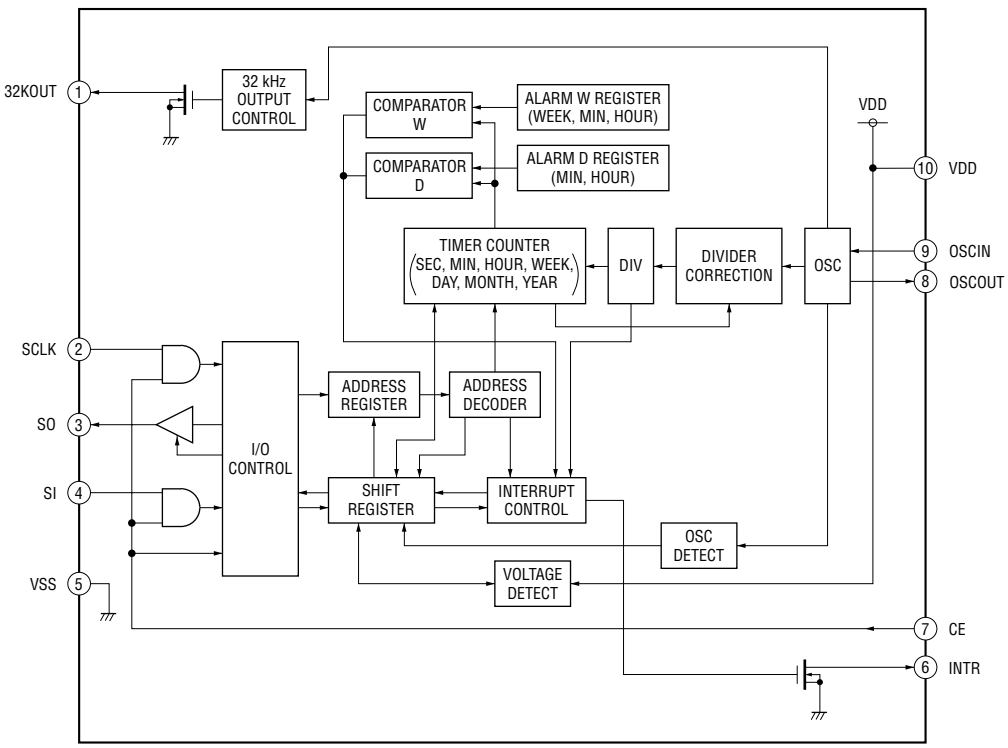


● **IC Block Diagrams (DIGITAL SECTION)**

IC702 TC7S08FU (TE85R)



IC706 RS5C348A-E2

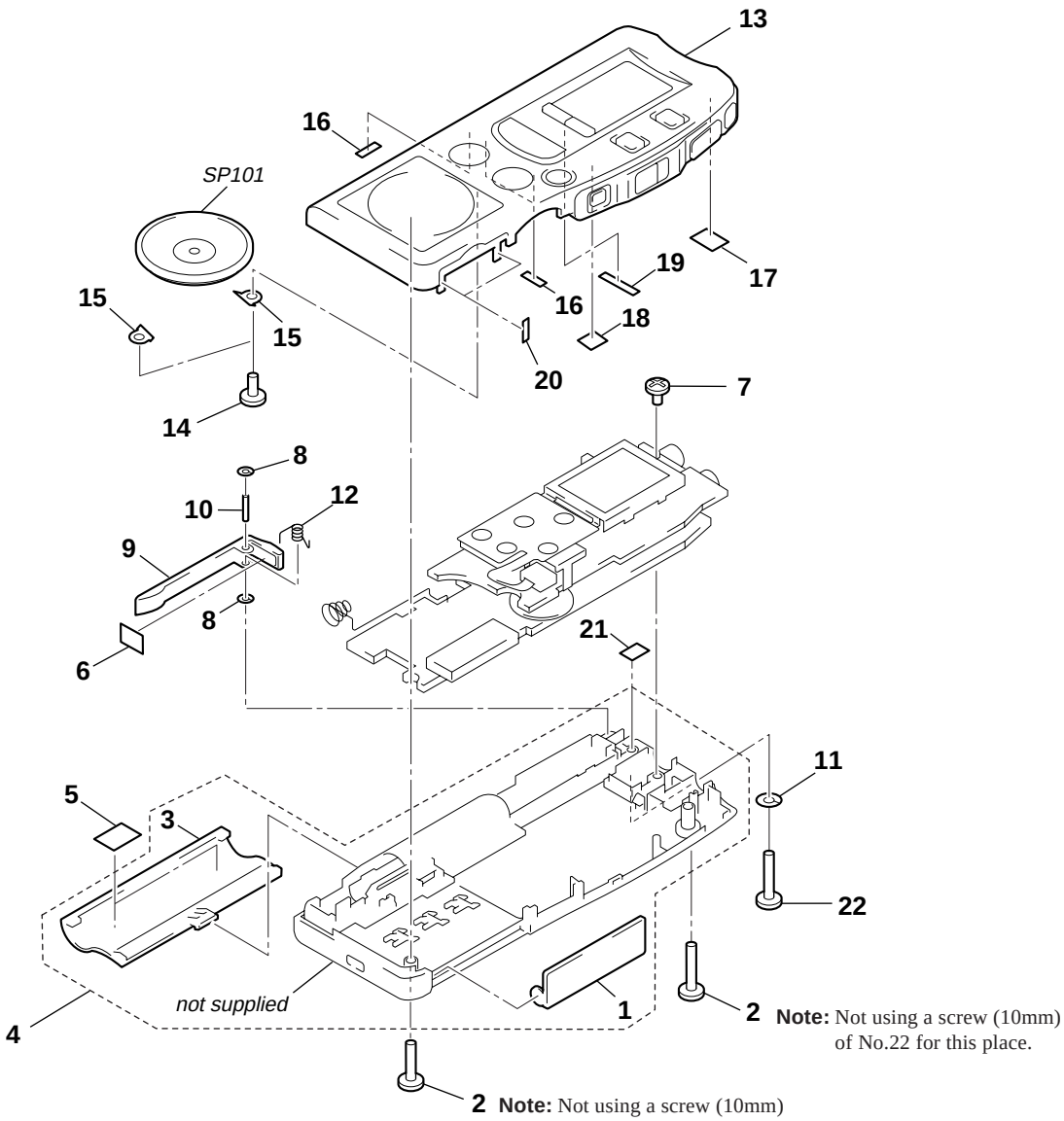


SECTION 5
EXPLODED VIEWS

NOTE :

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " * "are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Aaccessories and packing materials are given in the last of this parts list.

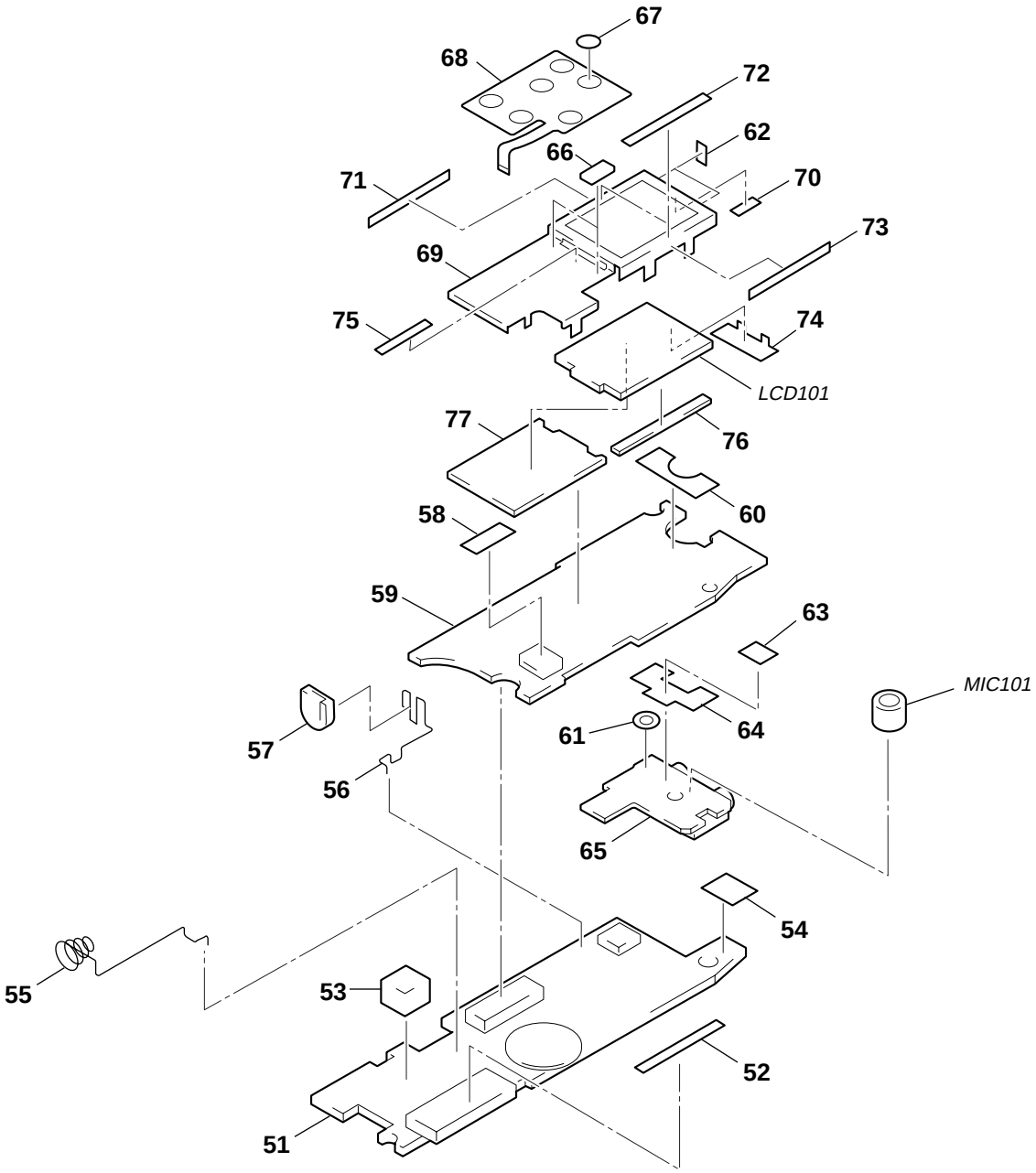
5-1. CASE SECTION



Ref. No.	Part No.	Description	Remark
1	4-217-035-01	CAP (PC)	
2	3-318-203-91	SCREW (B1.7X9), TAPPING	
3	4-217-034-01	LID, BATTERY CASE	
4	A-3328-290-A	CASE ASSY	
5	4-220-198-01	CUSHION (BATT)	
6	4-221-482-01	SPACER (CLIP)	
7	3-318-382-71	SCREW (1.7X4), TAPPING	
8	3-349-859-41	WASHER	
9	4-217-036-01	CLIP	
10	4-217-864-01	SHAFT (CLIP)	
11	4-221-241-01	WASHER (P)	
12	4-217-037-01	SPRING (CLIP)	

Ref. No.	Part No.	Description	Remark
13	X-4951-072-1	LID ASSY, UPPER	
14	3-375-114-41	SCREW	
15	4-217-032-01	BRACKET (SPEAKER)	
16	4-221-238-01	SHEET (BUTTON)	
17	4-220-916-01	SHEET (LED)	
18	4-221-239-01	SHEET (STOP)	
19	4-221-237-01	CUSHION (LCD)	
20	4-221-236-01	CUSHION (PC)	
21	4-221-616-01	SPACER (TERMINAL)	
22	3-334-565-01	SCREW (B1.7X10), TAPPING	
SP101	1-505-854-11	SPEAKER (2.8cm)	

5-2. MAIN BOARD SECTION



Ref. No.	Part No.	Description	Remark
51	A-3321-888-A	MAIN BOARD, COMPLETE	
52	4-221-243-01	CUSHION, RUBBER	
53	4-220-920-01	SPACER (P2)	
54	4-220-922-11	SHEET (F)	
55	4-217-039-01	TERMINAL (-), BATTERY	
56	4-217-038-01	TERMINAL (+), BATTERY	
57	4-217-040-01	CAP (TERMINAL)	
58	4-221-344-01	SPACER (FLASH)	
59	A-3321-891-A	DIGITAL BOARD, COMPLETE	
60	4-218-348-01	SHEET (MICROPHONE)	
61	4-221-241-11	WASHER (P)	
62	4-220-924-01	SHEET (H)	
63	4-220-200-01	SHEET (MICROPHONE), ADHESIVE	
64	4-219-466-01	SPACER (P)	
* 65	1-673-294-11	JACK BOARD	

Ref. No.	Part No.	Description	Remark
66	4-220-918-01	SPACER (HOLDER LR)	
67	3-016-413-21	SHEET (SW)	
68	1-418-318-11	UNIT, SWITCH	
69	4-217-031-01	HOLDER, LCD	
70	4-220-917-01	SPACER (HOLDER 2)	
71	4-220-199-01	SHEET (HOLDER)	
72	4-220-919-01	SHEET (HOLDER LR)	
73	4-220-921-01	SHEET (SW)	
74	4-220-141-01	SHEET (BL)	
75	4-220-197-01	SPACER (HOLDER)	
76	1-694-521-11	CONDUCTIVE BOARD, CONECTION	
77	4-218-499-01	PLATE, LIGHT GUIDE	
LCD101	1-803-522-11	DISPLAY PANEL, LIQUID CRYSTAL	
MIC101	1-542-384-11	MICROPHONE, ELECTRET CONDENSER	

SECTION 6
ELECTRICAL PARTS LIST

DIGITAL

NOTE :

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL : Metal-film resistor
  METAL OXIDE :Metal oxide-film resistor
  F : nonflammable
- Items marked " * "are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u : µ , for example :
  uA.... : µ A.... , uPA.... : µ PA....
  uPB.... : µ PB.... , uPC.... : µ PC....
  uPD.... : µ PD....
- CAPACITORS
  uF : µ F
- COILS
  uH : µ H

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description			Remark
	A-3321-891-A	DIGITAL BOARD, COMPLETE			
		**********			
	1-418-318-11	UNIT,SWITCH			
	1-694-521-11	CONDUCTIVE BOARD, CONECTION			
	4-217-031-01	HOLDER, LCD			
	4-218-499-01	PLATE, LIGHT GUIDE			
	4-220-141-01	SHEET (BL)			
	4-220-197-01	SPACER (HOLDER)			
	4-220-199-01	SHEET (HOLDER)			
	4-220-917-01	SPACER (HOLDER 2)			
	4-220-918-01	SPACER (HOLDER LR)			
	4-220-919-01	SHEET (HOLDER LR)			
	4-220-921-01	SHEET (SW)			
	4-220-922-11	SHEET (F)			
	4-220-924-01	SHEET (H)			
	4-221-344-01	SPACER (FLASH)			
		<CAPACITOR>			
C501	1-107-826-11	CERAMIC CHIP	0.1uF		16V
C504	1-110-569-11	TANTAL. CHIP	47uF	20%	6.3V
C701	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C702	1-104-913-91	TANTAL. CHIP	10uF	20%	16V
C704	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C708	1-113-988-11	TANTAL. CHIP	68uF	20%	4V
C709	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C711	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V
C712	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C715	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C721	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C726	1-162-921-91	CERAMIC CHIP	33PF		
C727	1-162-921-91	CERAMIC CHIP	33PF		
		<CONNECTOR>			
* CN704	1-785-876-21	CONNECTOR, FPC			
* CN705	1-785-874-21	PLUG, BOARD TO BOARD 50P			
		<DIODE>			
D502	8-719-073-33	LED CL-165HR/YG-D-T (OPR)			
D503	8-719-070-68	DIODE CL-220YG-C-TS (LCD BACK LIGHT)			
D504	8-719-070-68	DIODE CL-220YG-C-TS (LCD BACK LIGHT)			
D701	8-719-016-74	DIODE 1SS352			

Ref. No.	Part No.	Description			Remark
		<FERRITEBEAD>			
FB702	1-414-921-11	INDUCTOR CHIP			
FB703	1-414-921-11	INDUCTOR CHIP			
		<JUMPERREGISTOR>			
JC701	1-216-864-11	METAL CHIP	0	5%	1/16W
JC702	1-216-864-11	METAL CHIP	0	5%	1/16W
		<IC>			
IC501	8-759-333-42	IC XC61AN3002MR			
IC505	8-759-497-27	IC XC62AP2102MR			
IC701	8-759-583-36	IC KM29U128T			
IC702	8-759-058-62	IC TC7S08FU(TE85R)			
IC703	8-759-058-58	IC TC7S04FU(TE85R)			
IC704	8-759-579-98	IC uPD780308GC-113-8EU			
IC706	8-759-560-17	IC RS5C348A-E2			
		<LIQUIDCRYSTALDISPLAY PANEL>			
LCD101	1-803-522-11	DISPLAY PANEL, LIQUID CRYSTAL			
		<TRANSISTOR>			
Q501	8-729-426-25	TRANSISTOR XP1212			
Q503	8-729-402-32	TRANSISTOR 2SD1819A-R			
Q701	8-729-037-74	TRANSISTOR UN9213J-(TX).SO			
Q702	8-729-420-24	TRANSISTOR 2SB1218A-QRS			
Q703	8-729-420-24	TRANSISTOR 2SB1218A-QRS			
		<RESISTOR>			
R501	1-216-845-11	METAL CHIP	100K	5%	1/16W
R502	1-216-821-11	METAL CHIP	1K	5%	1/16W
R503	1-216-817-11	METAL CHIP	470	5%	1/16W
R505	1-216-821-11	METAL CHIP	1K	5%	1/16W
R507	1-216-833-91	RES,CHIP	10K	5%	1/16W
R508	1-216-793-11	RES,CHIP	5	5%	1/16W
R513	1-216-809-11	METAL CHIP	100	5%	1/16W
R701	1-216-845-11	METAL CHIP	100K	5%	1/16W
R702	1-216-845-11	METAL CHIP	100K	5%	1/16W
R703	1-216-857-11	METAL CHIP	1M	5%	1/16W
R704	1-216-854-11	METAL CHIP	560K	5%	1/16W
R711	1-216-849-11	METAL CHIP	220K	5%	1/16W
R712	1-216-849-11	METAL CHIP	220K	5%	1/16W
R713	1-216-857-11	METAL CHIP	1M	5%	1/16W

DIGITAL JACK MAIN

Ref. No.	Part No.	Description			Remark
R714	1-216-854-11	METAL CHIP	560K	5%	1/16W
R715	1-216-849-11	METAL CHIP	220K	5%	1/16W
R719	1-218-871-11	RES,CHIP	10K	0.50%	1/16W
R720	1-218-875-11	RES,CHIP	15K	0.50%	1/16W
R721	1-216-855-11	METAL CHIP	680K	5%	1/16W
R722	1-216-821-11	METAL CHIP	1K	5%	1/16W
R723	1-216-821-11	METAL CHIP	1K	5%	1/16W
R728	1-216-831-91	METAL CHIP	10K	5%	1/16W
R729	1-218-879-11	RES,CHIP	22K	0.50%	1/16W
R730	1-218-887-11	METAL CHIP	47K	0.50%	1/16W
R731	1-216-855-11	METAL CHIP	680K	5%	1/16W
R734	1-216-833-91	RES,CHIP	10K	5%	1/16W
R737	1-216-853-11	METAL CHIP	470K	5%	1/16W
R738	1-216-833-91	RES,CHIP	10K	5%	1/16W
R739	1-216-833-91	RES,CHIP	10K	5%	1/16W
R740	1-216-833-91	RES,CHIP	10K	5%	1/16W
R741	1-216-833-91	RES,CHIP	10K	5%	1/16W
R742	1-216-845-11	METAL CHIP	100K	5%	1/16W
R744	1-216-853-11	METAL CHIP	470K	5%	1/16W
R745	1-216-821-11	METAL CHIP	1K	5%	1/16W
R747	1-216-845-11	METAL CHIP	100K	5%	1/16W
R764	1-216-845-11	METAL CHIP	100K	5%	1/16W
R766	1-216-857-11	METAL CHIP	1M	5%	1/16W
		<SWITCH>			
S701	1-771-585-11	SWITCH, PUSH (1 KEY) (● REC/STOP)			
S702	1-762-366-11	SWITCH, TACTILE (FILE)			
S703	1-762-366-11	SWITCH, TACTILE (INDEX)			
S704	1-771-585-11	SWITCH, PUSH (1 KEY) (ERASE)			
S711	1-771-248-11	SWITCH, TACTILE (▮▮ PAUSE)			
S712	1-572-922-11	SWITCH, SLIDE (HOLD)			
		<VIBRATOR>			
* X701	1-767-994-22	VIBRATOR, CRYSTAL (32.768kHz)			
X702	1-767-144-21	VIBRATOR, CERAMIC (5MHz)			
**********					
*	1-673-294-11	JACK BOARD			
		**********			
		<CONNECTOR>			
* CN101	1-785-873-21	CONNECTOR, BOARD TO BOARD 10P			
		<JACK>			
J101	1-784-848-21	JACK (MIC (PLUG-IN POWER))			
J102	1-785-869-21	JACK (EARPHONE)			
**********					
	A-3321-888-A	MAIN BOARD, COMPLETE			
		**********			
		<CAPACITOR>			
C101	1-104-913-11	TANTAL. CHIP	10uF	20%	10V
C102	1-115-156-11	CERAMIC CHIP	1uF		10V
C103	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C104	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C105	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C106	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C107	1-113-600-11	TANTAL. CHIP	2.2uF	20%	6.3V
C108	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C109	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C110	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C111	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C112	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C114	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C116	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C118	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C124	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C125	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C126	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C127	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C128	1-125-926-91	TANTAL. CHIP	4.7uF	20%	6.3V
C129	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C130	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C131	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C133	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C134	1-109-847-11	TANTAL. CHIP	0.47uF	20%	16V
C136	1-117-370-11	CERAMIC CHIP	10uF		10V
C137	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V
C139	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C140	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C141	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C142	1-164-471-11	CERAMIC CHIP	680PF	5%	50V
C143	1-164-471-11	CERAMIC CHIP	680PF	5%	50V
C144	1-164-471-11	CERAMIC CHIP	680PF	5%	50V
C145	1-164-471-11	CERAMIC CHIP	680PF	5%	50V
C146	1-164-360-11	CERAMIC CHIP	0.1uF		16V
* C147	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C148	1-115-156-11	CERAMIC CHIP	1uF		10V
C149	1-109-847-11	TANTAL. CHIP	0.47uF	20%	16V
C151	1-117-370-11	CERAMIC CHIP	10uF		10V
C152	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C153	1-107-726-91	CERAMIC CHIP	0.01uF	10%	16V
C154	1-107-726-91	CERAMIC CHIP	0.01uF	10%	16V
C155	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C156	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C157	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C158	1-113-682-11	TANTAL. CHIP	33uF	20%	10V
C160	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C161	1-162-957-91	CERAMIC CHIP	220PF	5%	50V
C162	1-164-471-11	CERAMIC CHIP	680PF	5%	50V
C502	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C505	1-110-569-11	TANTAL. CHIP	47uF	20%	6.3V
C506	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C508	1-117-370-11	CERAMIC CHIP	10uF		10V
C509	1-128-829-91	TANTAL. CHIP	220uF	20%	6.3V
C510	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C512	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C513	1-117-370-11	CERAMIC CHIP	10uF		10V
C710	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C716	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C717	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C718	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V

Ref. No.	Part No.	Description			Remark
C719	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C722	1-104-851-91	TANTAL. CHIP	10uF	20%	10V
* C723	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
* C724	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C725	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C730	1-107-726-91	CERAMIC CHIP	0.01uF	10%	16V
		<CONNECTOR>			
* CN102	1-785-872-21	PLUG, BOARD TO BOARD 10P			
CN701	1-785-871-21	CONNECTOR, PC LINK (DIGITAL I/O)			
* CN703	1-785-875-21	CONNECTOR, BOARD TO BOARD 50P			
		<DIODE>			
D501	8-719-073-35	DIODE RB551V-30TE-17			
		<FERRITEBEAD>			
FB101	1-414-593-21	FERRITE BEAD INDUCTOR			
FB102	1-414-593-21	FERRITE BEAD INDUCTOR			
FB103	1-414-593-21	FERRITE BEAD INDUCTOR			
FB104	1-414-593-21	FERRITE BEAD INDUCTOR			
FB105	1-414-593-21	FERRITE BEAD INDUCTOR			
FB106	1-414-593-21	FERRITE BEAD INDUCTOR			
FB107	1-414-593-21	FERRITE BEAD INDUCTOR			
FB501	1-414-921-11	INDUCTOR	2.2uH		
FB503	1-414-921-11	INDUCTOR	2.2uH		
FB701	1-414-921-11	INDUCTOR	2.2uH		
		<IC>			
IC101	8-759-567-09	IC MSM7590L-01TS-K			
IC102	8-759-567-10	IC XC25A08510MR			
IC103	8-759-574-34	IC LMV358MMX			
IC104	8-759-701-51	IC NJM2072M			
IC105	8-759-582-03	IC NJM2149V-TE2			
IC106	8-759-082-60	IC TC7S66FU			
IC107	8-759-358-47	IC NJM2115V(TE2)			
IC108	8-759-582-03	IC NJM2149V-TE2			
IC109	8-759-586-57	IC AN6123MS			
IC502	8-759-583-76	IC XC62GR3522MR			
IC503	8-759-582-02	IC XC6372C381PR			
IC504	8-759-592-24	IC XC61AN1502MR			
IC506	8-759-583-76	IC XC62GR3522MR			
IC705	8-759-595-14	IC XC61A2202MR			
IC707	8-759-592-25	IC CXD9519TQ			
IC708	8-759-583-76	IC XC62GR3522MR			
IC709	8-759-058-62	IC TC7S08FU(TE85R)			
IC710	8-759-333-42	IC XC61AN3002MR			
IC777	8-759-710-84	IC NJM2406F-TE2			
		<COIL>			
L501	1-469-395-21	INDUCTOR			
L503	1-414-752-11	INDUCTOR	2.2uH		
		<TRANSISTOR>			
Q101	8-729-429-44	TRANSISTOR XP1501			
Q102	8-729-037-63	TRANSISTOR UN9115J-(TX).SO			
Q103	8-729-429-50	TRANSISTOR XP4312			
Q105	8-729-039-57	TRANSISTOR DTC363EKT146			
Q108	8-729-048-59	TRANSISTOR XC161A1265PR			

Ref. No.	Part No.	Description			Remark
Q109	8-729-037-76	TRANSISTOR UN9215J-(TX).SO			
Q110	8-729-037-76	TRANSISTOR UN9215J-(TX).SO			
Q502	8-729-427-74	TRANSISTOR XP4601			
Q704	8-729-037-63	TRANSISTOR UN9115J-(TX).SO			
Q777	8-729-037-63	TRANSISTOR UN9115J-(TX).SO			
		<RESISTOR>			
R102	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R103	1-216-815-11	METAL CHIP	330	5%	1/16W
R104	1-216-839-11	METAL CHIP	33K	5%	1/16W
R105	1-216-833-91	RES,CHIP	10K	5%	1/16W
R106	1-216-821-11	METAL CHIP	1K	5%	1/16W
R107	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R108	1-216-821-11	METAL CHIP	1K	5%	1/16W
R109	1-216-841-11	METAL CHIP	47K	5%	1/16W
R110	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R111	1-216-841-11	METAL CHIP	47K	5%	1/16W
R112	1-216-841-11	METAL CHIP	47K	5%	1/16W
R113	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R116	1-216-833-91	RES,CHIP	10K	5%	1/16W
R117	1-216-833-91	RES,CHIP	10K	5%	1/16W
R118	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R120	1-216-845-11	METAL CHIP	100K	5%	1/16W
R121	1-216-845-11	METAL CHIP	100K	5%	1/16W
R122	1-209-926-11	METAL CHIP	36K	5%	1/16W
R131	1-216-835-11	METAL CHIP	15K	5%	1/16W
R132	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R133	1-216-833-91	RES,CHIP	10K	5%	1/16W
R134	1-216-841-11	METAL CHIP	47K	5%	1/16W
R135	1-216-841-11	METAL CHIP	47K	5%	1/16W
R136	1-216-837-11	METAL CHIP	22K	5%	1/16W
R137	1-216-849-11	METAL CHIP	220K	5%	1/16W
R138	1-216-833-91	RES,CHIP	10K	5%	1/16W
R139	1-216-839-11	METAL CHIP	33K	5%	1/16W
R140	1-216-845-11	METAL CHIP	100K	5%	1/16W
R141	1-216-837-11	METAL CHIP	22K	5%	1/16W
R142	1-216-853-11	METAL CHIP	470K	5%	1/16W
R143	1-209-926-11	METAL CHIP	36K	5%	1/16W
R144	1-218-292-11	RES,CHIP	20K	5%	1/16W
R145	1-216-833-91	RES,CHIP	10K	5%	1/16W
R146	1-218-292-11	RES,CHIP	20K	5%	1/16W
R147	1-216-817-11	METAL CHIP	470	5%	1/16W
R148	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R149	1-216-837-11	METAL CHIP	22K	5%	1/16W
R150	1-216-837-11	METAL CHIP	22K	5%	1/16W
R151	1-216-853-11	METAL CHIP	470K	5%	1/16W
R152	1-216-849-11	METAL CHIP	220K	5%	1/16W
R153	1-216-833-91	RES,CHIP	10K	5%	1/16W
R154	1-216-845-11	METAL CHIP	100K	5%	1/16W
R155	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R156	1-216-797-11	METAL CHIP	10	5%	1/16W
R157	1-216-797-11	METAL CHIP	10	5%	1/16W
R160	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R161	1-216-821-11	METAL CHIP	1K	5%	1/16W
R162	1-216-799-11	METAL CHIP	15	5%	1/16W
R163	1-216-835-91	RES,CHIP	15K	5%	1/16W
R164	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R166	1-216-857-11	METAL CHIP	1M	5%	1/16W

MAIN

Ref. No.	Part No.	Description			Remark
R167	1-216-833-91	RES,CHIP	10K	5%	1/16W
R171	1-216-813-91	METAL CHIP	220	5%	1/16W
R504	1-216-853-11	METAL CHIP	470K	5%	1/16W
R506	1-216-853-11	METAL CHIP	470K	5%	1/16W
R509	1-216-857-11	METAL CHIP	1M	5%	1/16W
R510	1-216-849-11	METAL CHIP	220K	5%	1/16W
R511	1-218-895-11	RES,CHIP	100K	0.50%	1/16W
R512	1-218-895-11	RES,CHIP	100K	0.50%	1/16W
R514	1-216-845-11	METAL CHIP	100K	5%	1/16W
R515	1-216-864-11	METAL CHIP	0	5%	1/16W
R724	1-216-855-11	METAL CHIP	680K	5%	1/16W
R725	1-216-821-11	METAL CHIP	1K	5%	1/16W
R726	1-216-849-11	METAL CHIP	220K	5%	1/16W
R727	1-216-849-11	METAL CHIP	220K	5%	1/16W
R733	1-216-845-11	METAL CHIP	100K	5%	1/16W
R743	1-216-833-91	RES,CHIP	10K	5%	1/16W
R732	1-216-845-11	METAL CHIP	100K	5%	1/16W
R749	1-216-845-11	METAL CHIP	100K	5%	1/16W
R750	1-216-833-91	RES,CHIP	10K	5%	1/16W
R751	1-216-845-11	METAL CHIP	100K	5%	1/16W
R752	1-216-833-91	RES,CHIP	10K	5%	1/16W
R753	1-216-833-91	RES,CHIP	10K	5%	1/16W
R754	1-216-813-91	METAL CHIP	220	5%	1/16W
R755	1-216-813-91	METAL CHIP	220	5%	1/16W
R756	1-216-837-11	METAL CHIP	22K	5%	1/16W
R758	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R761	1-216-821-11	METAL CHIP	1K	5%	1/16W
R762	1-216-841-11	METAL CHIP	47K	5%	1/16W
R763	1-216-833-91	RES,CHIP	10K	5%	1/16W
R764	1-216-845-11	METAL CHIP	100K	5%	1/16W
R765	1-216-849-11	METAL CHIP	220K	5%	1/16W

<COMPOSITION CIRCUIT BLOCK >

RB701	1-233-957-11	RES, NETWORK (CHIP TYPE) 220
RB702	1-233-957-11	RES, NETWORK (CHIP TYPE) 220
RB704	1-233-961-21	RES, NETWORK (CHIP TYPE) 1K
RB705	1-233-961-21	RES, NETWORK (CHIP TYPE) 1K

<VARIABLE RESISTOR >

RV101	1-225-502-41	RES, VAR, CARBON 10K/10K(◢ VOL)

<SWITCH>

S101	1-572-922-11	SWITCH, SLIDE (MIC SENS)
S713	1-572-922-11	SWITCH, SLIDE (VOR)
S714	1-692-605-31	SWITCH, SLIDE (PLAY SPEED)

****

MISCELLANEOUS
****

11	1-418-318-11	UNIT, SWITCH
14	1-694-521-11	CONDUCTIVE BOARD, CONECTION
LCD101	1-803-522-11	DISPLAY PANEL, LIQUID CRYSTAL
MIC101	1-542-384-11	MICROPHONE, ELECTRET CONDENSER
SP101	1-505-854-11	SPEAKER (2.8cm)

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Ref. No.	Part No.	Description	Remark
		ACCESSORIES&PACKING MATERIALS	
		**********	
	3-866-532-01	MANUAL, INSTRUCTION (JAPANESE) (Tourist)	
	3-866-532-11	MANUAL, INSTRUCTION (ENGLISH) (US)	
	3-866-532-21	MANUAL, INSTRUCTION (ENGLISH,FRENCH)	(AEP)
	3-866-532-31	MANUAL, INSTRUCTION (SPANISH, PORTUGUESE)	(AEP)
	3-866-532-41	MANUAL, INSTRUCTION (DANISH,DUTCH)	(AEP)
	3-866-532-51	MANUAL, INSTRUCTION (SWEDISH,ITALIAN)	(AEP)
	3-866-532-61	MANUAL, INSTRUCTION (ENGLISH,KOREAN, CHINESE)	(Tourist)
	4-217-041-01	CASE, CARRYING	

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